

SIZE OF FIRMS AND ITS IMPACT ON FINANCIAL PERFORMANCE OF SELECT INDIAN PUBLIC LIMITED COMPANIES

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ABSTRACT

The large size firms will grab up the opportunities of being big. Production costs are generally lower in case of large size firms when compared to the small size firms. Production costs will be lower because of availability of number of economies for producing on a large scale by availing particularly the internal economies. They enjoy the cost advantages from the expansion of their size. The internal economies are available to a particular firm and give the firm an advantage over other firms. This is because, internal economies results due to firms own expansion. The present study is carried out to identify whether these internal economies derived from different functional areas are truly enjoyed by the large size firms when compared to small size firms. 9335 Public Limited Companies operating in India are selected. The data has been collected from the Reserve Bank of India data base for a period of three years from 2014 to 2016. These companies are divided into seven categories. Analysis of variance indicates greater difference among the different categories of public limited companies with respect to their profitability, expenditure and turnover positions.

KEYWORDS: Profitability, Expenditure, Turnover, ANOVA and Post Hoc Test.

Introduction

The large size firms will grab up the opportunities of being big i.e they enjoy the advantage of reducing different elements of costs in terms of economies of scale and thereby increase their profits when compared to other sizes of firms. Production costs are generally lower in case of large size firms when compared to the small size firms. Production costs will be lower because of availability of number of economies for producing on a large scale by availing particularly the internal economies. They enjoy the cost advantages from the expansion of their size. The internal economies are available to a particular firm and give the firm an advantage over other firms. This is because, internal economies results due to firms own expansion. Labor cost per unit will be reduced by practicing division of labor, if a firm expands its scale output. Very often large firms enjoy technical economies from use of sub-size machines for producing on large scale and also by utilizing their by-products and waste to produce other products.

Greater specialization in managerial staff and mechanization of data processing is possible if the size of the firm increases. Managerial economies results from all these activities. A big size firm can avail marketing economies in its bulk purchases as well as sales. There will be a greater scope for spreading of risks through diversification of output and market for a large producer. With this backdrop, the present study is carried out to identify whether these internal economies derived from different functional areas are truly enjoyed by the large size firms when compared to small size firms. The cost advantage will result in increase in profit, as such the profitability ratios are taken up for the study. To examine the extent of availability of marketing, managerial, storage and labor economies, expenses ratios are considered. The relationship between the level of activity and the effective usage of assets are

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measured by the Turnover ratios also known as asset management ratios. These ratios measure how efficiently the assets are employed by a firm. Therefore an attempt is made in this study, to identify whether the different sizes of the firms differ with respect to their profitability and expenditure and also to test their efficiency with respect to turnover ratios.

Literature Review

J.M. Samuels, D.J. Smyth, (1969) in their study examined the relationship between size of the firm and rate of return of 186 UK companies. Companies were divided into ten groups based on net assets, a measure of firm's size. Ratio of profit before tax to net assets is used as a measure of profitability. Using ANOVA, they found evidences that a firm's size is a significant factor in the determination of its profits.

Massimiliano Celli. (2013) contributed to identify the determinants of economies of scale in large businesses. The study identifies and analyzes the economies of cost that, according to most of the well-established literature, contribute jointly to originate the phenomenon at stake. The study analyzed the information collected through specially designed questionnaires from a sample of business listed on regulated European markets. The aim of the questionnaires is to verify if such companies obtain economies of scale in their productive processes and, if so, to identify which of the cost economies previously analyzed are actually achieved. Specifically, the study tried to overcome a one-way and sole interpretation of the economies of scale phenomenon in favour of distinction in economies of scale.

Ragupathi, Aparna K. (2017) have identified that firms with different size differ with respect to their profitability. The study was conducted on seventy five manufacturing Central Public Sector Enterprises (CPSEs) operating in India. These enterprises were divided into three categories based on total assets. Analysis of variance indicates greater difference among the different categories of enterprises with respect to their profitability. No two sizes of enterprises are grouped in a homogeneous subset. From this we can conclude undoubtedly that the large size firms are enjoying the advantage of being big in terms of high profits.

Ranasalman, Anwarsalman Ali. (2015) stressed on the need for availability of information about economies of scale which are essential for regulatory and organization decisions. Because of its arrangement, the financial business also provides us with an outstanding source of data for measuring the cost function. Economies of scale give a way to businesses for maximizing their production and minimizing the cost of that production. Businesses control their cost with the help of internal economies of scale and external economies of scale analysis. This study proposed a critical review of the publish literature for clarification of the concept.

Tucker, K. A.(1972) examined the relationship between the size of supermarkets and various aspects of their operating performance. There is in fact very little evidence which relates to size of supermarkets and various aspects of their operating performance. Rather, concerned with more general relationships between size and performance.

Tilley, R.P.R., Hicks, R. (1970) observed that supermarket trading is one of the most competitive forms of retailing, and an area in which modern techniques of management, accounting and marketing are often to be found. One major factor in determining the profitability and performance of retail outlets is the size of their selling areas. For this reason, this study has analyzed the operating performance of a range of supermarkets of deferent sizes. The study has suggested that the trend toward larger supermarkets may not lead to commercial efficiency and profitability at the branch.

Rajindar.K and Koshal (1970) examined economies of scale in bus transport as experienced in India. Estimates of the long-run marginal cost (per passenger-kilometer) for sections of the bus industry are compared with bus fares and with railway costs. The study compared various costs which influenced price with profits in the long run.

Objective of the Study

The objective of the study is to identify whether different sizes of the firms differ with respect to their profit, expenses and turnover position.

Hypotheses of the Study

The hypotheses designed for the study are:

- H₀₁: Different sizes of companies do not differ with respect to their profitability ratios.
- H₀₂: Different sizes of companies do not differ with respect to their expenditure ratios.
- H₀₃: Different sizes of companies do not differ with respect to their turnover ratios.

Methodology of the Study

In an attempt to know whether the large size firms will grab up the opportunities of being big, 9335 Public Limited Companies operating in India are selected. Data has been collected from the Reserve Bank of India data base for a period of three years from 2014 to 2016. These companies are divided into seven categories based on total assets which are a measure of firm's size as on March 2014 (J.M.Samuels and D.J.Smyth, 1969). Category seven consists of 475 companies with total assets of one Billion and above, 396 companies comes under category six with a total assets of less than one Billion but more than 50 Million, 664 companies whose total assets are less than 500 Million but more than 250 Million form category five, 1613 companies whose total assets are less than 250 Million but more than 100 Million are grouped under category four, 1494 companies whose total assets are less than 50 Million but more than 100 Million form category three, 2659 companies whose total assets are less than 50 Million but more than 20 Million comes under category two and 2034 companies whose total assets are less than 20 Million but more than 10 Million are categorized as one. Table 1 exhibits the information about the category wise distribution of public limited companies selected for the study.

Table 1

S. No	Size based on Total Assets	Number of Public Limited Companies
1	10 Million to 20 Million	2034
2	20 Million to 50 Million	2659
3	50 Million to 100 Million	1494
4	100 Million to 250 Million	1613
5	250 Million to 500 Million	664
6	500 Million to 1 Billion	396
7	1 Billion and Above	475
	Total	9335

Source: RBI Data Base

Ratio of Profit after tax to sales (PAT/SALES) and ratio of Profit after tax to Net worth (PAT/NW) are used as a measure of profitability to test the first hypothesis designed for the study. To test the second hypothesis designed for the study, Ratio of Employee expenses to total expenditure (EMP/TE) and ratio of cost of raw material to total expenditure (COM/TE) are used as a measure for cost effectiveness. To test the third hypothesis designed for the study, Ratio of trade receivables to sales (DR/SALES) and ratio of inventory to sales (STOCK/SALES) are used as a measure for turnover position. The data is analyzed using statistical technique ANOVA.

Analysis and Inferences

• Analysis of Profitability Ratios

To test the hypotheses designed for the study, Analysis of Variance (ANOVA) is applied. As ANOVA is a parametric test, before analyzing the data, the data has to satisfy two important assumptions. First the data should be normally distributed and the second is that the variance of each sample group should be same. To test the normality of the data, the Shapiro-Wilk test is used and to test the equality of variance, Levene's Homogeneity of variance test is applied.

Table 2: Profitability Ratios and Shapiro-Wilk Test of Normality

Size of the Public Limited Companies	Ratio of PAT to Sales			Ratio of PAT to Net worth		
	Statistic	DF	Sig.	Statistic	DF	Sig.
1	1.000	3	1.000	.993	3	.843
2	.964	3	.637	.976	3	.702
3	.832	3	.194	.881	3	.328
4	.998	3	.915	.970	3	.668
5	.964	3	.637	.949	3	.567
6	.999	3	.927	.800	3	.114
7	.985	3	.765	.972	3	.679

Source: Authors' Calculations

Results of Shapiro-Wilk test are presented in Table 2. From the Shapiro-Wilk test which is applied for the seven different sizes of Public Limited Companies shows that the data is normally distributed as the significance value is more than 0.05 ($p > 0.05$) for both the profitability ratios. Hence, the first assumption to analyze the data using ANOVA is satisfied.

Table 3: Profitability Ratios and Test of Homogeneity of Variance

	Levene Statistic	DF1	DF2	Sig
Ratio of PAT to Sales	2.296	6	14	.094
Ratio of PAT to Net worth	1.423	6	14	.274

Source: Authors' Calculations

The second important assumption i.e equality of variance among the sample groups is equal is tested by applying Levene's Homogeneity of variance test and is presented in Table 3. The test indicates that the variance of the seven sizes of firms is equal with a significance value of 0.094 and 0.274 respectively for the data on both profitability ratios ($p > 0.05$). Another pre-requisite of ANOVA is also satisfied.

Table 4 exhibits the results of ANOVA test for Profitability Ratios. ANOVA decomposes the variance into two parts. First one is 'between the groups' and the second is 'within the groups'. F-statistic is obtained by dividing mean squares between the groups by mean square within the groups. In the present analysis, the mean square between the groups is more than mean square within the groups and the resulting F value is 12.423 with respect to ratio of PAT to Sales. This is significant at 1 per cent level ($p < 0.01$) and the null hypothesis is rejected at 5 percent level of significance and concluded that the seven categories of firms differ from one other. However, with respect to ratio of PAT to Net worth of these Public Limited Companies, the null hypothesis is accepted at 5 percent level of significance and concluded that the seven categories of firms do not differ from one another as also observed from table 5.

Table 4: Profitability Ratios and Analysis of Variance (ANOVA)

	F-Statistic	p-value
Ratio of PAT to Sales	12.423	.000
Ratio of PAT to Net worth	2.393	.084

Source: Authors' Calculations

The results of ANOVA clearly indicate that the Public Limited Companies differ significantly with respect to their profitability ratio i.e ratio of PAT to sales and now there is a need to analyze further which of the seven categories differ from one other. Table 5 reveals the results of homogeneous subsets which classify the companies into homogeneous groups. Alpha 0.05 indicates the null hypothesis that the companies in the same column do not differ significantly. Three subsets are defined with respect to ratio of PAT to sales with a significant value ($p > 0.05$). This reveals that the seven categories differ significantly with respect to their profitability ratio i.e PAT to sales.

Table 5: Homogeneous Subsets

Ratio of PAT to Sales				Ratio of PAT to Net worth			
Size of the Public Limited Companies	N	Subset for alpha=0.05			Size of the Public Limited Companies	N	Subset for alpha=0.05
		1	2	3			1
2	3	4.63			3	3	10.73
3	3	4.76			2	3	10.90
5	3	5.13	5.13		5	3	11.16
4	3	5.66	5.66		1	3	11.33
1	3	6.20	6.20		7	3	11.66
6	3		6.96	6.96	4	3	11.76
7	3			8.60	6	3	12.96
Sig.		.153	.069	.126	Sig.		1.00

Source: Authors' Calculations

• Analysis of Expenditure Ratios

To apply ANOVA for the expenditure ratios, the data is to be normally distributed and the variance among the sample groups should be equal. These assumptions are tested by applying Shapiro-Wilk test and Levene's homogeneity of variance test. The results of Shapiro-Wilk test (Table 6) for the seven different sizes of Public Limited Companies shows that the data is normally distributed as the significance value is more than 0.05 ($p > 0.05$) for both the expenditure ratios. Hence, the first assumption to analyze the data using ANOVA is satisfied.

Table 6: Expenditure ratios and Shapiro-Wilk Test of Normality

Size of the Public Limited Companies	Employee Expenses to Total Expenditure			Cost of Raw Material to Total Expenditure		
	Statistic	DF	Sig.	Statistic	DF	Sig.
1	.964	3	.637	.951	3	.576
2	.987	3	.780	.996	3	.878
3	.942	3	.537	.923	3	.463
4	.991	3	.817	.929	3	.485
5	.991	3	.817	.942	3	.537
6	.980	3	.726	.838	3	.209
7	.990	3	.811	.988	3	.789

Levene's homogeneity of variance test is used to test the second important assumption i.e variance among the sample groups is equal is tested and is presented in Table 7. The test indicates that the variance of the seven sizes of firms is equal with a significance value of 0.12 and 0.055 respectively for the data on both turnover ratios ($p > 0.05$). Another pre-requisite of ANOVA is also satisfied.

Table 7: Expenditure ratios and Test of Homogeneity of Variance

	Levene's Statistic	DF1	DF2	Sig
Employee Expenses to Total Expenditure	2.093	6	14	.120
Cost of Raw Material to Total Expenditure	2.761	6	14	.055

Source: Authors' Calculations

Table 8 exhibits the results of ANOVA test for expenditure ratios. The F value is 15.738. This is significant at 1 per cent level of significance ($p < 0.01$) with respect to ratio of employee expenses to total expenditure and the F value is 7.066 with respect to ratio of cost of raw material to total expenditure which is also significant at one percent level. In both the ratios indicating efficiency in reducing expenses with increase in size, the null hypothesis is rejected at 5 percent level of significance and it is observed that these seven categories of firms differ from one other as also observed from table 9.

Table 8: Expenditure Ratios and Analysis of Variance (ANOVA)

	F-Statistic	p-value
Employee Expenses to Total Expenditure	15.738	.000
Cost of Raw Material to Total Expenditure	7.066	.001

Source: Authors' Calculations

Table 9 reveals the results of homogeneous subsets which classify the firms into homogeneous groups. Alpha value of more than 0.05 indicates the acceptance of the null hypothesis that the companies in the same column do not differ significantly. Four subsets are defined with respect to ratio of employee expenses to total expenditure with a significant value of more than ten ($p > 0.099$). This reveals that the seven categories differ significantly with respect to their expenditure ratios.

Table 9: Expenditure Ratios and Homogeneous Subsets

Ratio of Employee Expenses to Total Expenditure					Ratio of Cost of Raw Material to Total Expenditure					
Size of the Public Limited Companies	N	Subset for alpha=0.05				Size of the Public Limited Companies	N	Subset for alpha=0.05		
		1	2	3	4			1	2	3
2.00	3	4.33				7.00	3	56.73		
1.00	3		6.83			4.00	3	60.23	60.23	
5.00	3		7.06	7.067		1.00	3	60.80	60.80	
6.00	3		7.13	7.13		6.00	3	62.63	62.63	62.63
3.00	3		7.50	7.50		5.00	3		65.00	65.00
4.00	3			8.86	8.86	3.00	3		65.56	65.56
7.00	3				9.56	2.00	3			67.43
Sig		1.00	.912	.099	.892	Sig		.10	.162	.052

Source: Authors' Calculations

Three subsets are defined with respect to ratio of cost of raw material to total expenditure with a significant value of more than ten ($p > 0.05$). This reveals that the seven categories differ significantly with respect to their expenditure ratios.

- **Analysis of MTurnover Ratios**

Two assumptions to apply ANOVA for the data on turnover ratios are tested by applying Shapiro-Wilk test and Levene's homogeneity of variance test. Results of Shapiro-Wilk test are presented in Table 10. The Shapiro-Wilk test for the seven different sizes of Public Limited Companies shows that the data is normally distributed as the significance value is more than 0.05 ($p > 0.05$) for both the turnover ratios. Hence, the first assumption to analyze the data using ANOVA is satisfied.

Table 10: Turnover Ratios and Shapiro-Wilk Test of Normality

Size of the Public Limited Companies	Trade receivables to Sales			Inventories to Sales		
	Statistic	DF	Sig.	Statistic	DF	Sig.
1	.800	3	.114	.964	3	.637
2	.855	3	.253	.893	3	.363
3	1.000	3	1.000	.987	3	.780
4	.855	3	.253	.964	3	.637
5	.964	3	.637	1.000	3	1.000
6	.980	3	.726	.949	3	.567
7	.871	3	.298	.964	3	.637

Results of Levene's Homogeneity of variance test are presented in Table 11. The test indicates that the variance of the seven sizes of firms is equal with a significance value of 0.069 and 0.334 respectively for the data on both turnover ratios ($p > 0.05$). Another pre-requisite of ANOVA is also satisfied.

Table 11: Turnover Ratios and Test of Homogeneity of Variance

	Levene Statistic	DF1	DF2	Sig
Trade receivables to Sales	2.566	6	14	.069
Inventories to Sales	1.263	6	14	.334

Source: Authors' Calculations

Table 12 exhibits the results of ANOVA test for Turnover Ratios. The F value is 30.832 which is significant at 1 per cent level of significance ($p < 0.01$) with respect to ratio of trade receivables to sales and the F value is 117.504 which is also significant at one percent level respect to ratio of inventories to sales. In case of both the ratios indicating turnover position, the null hypothesis is rejected at 5 percent level of significance and it is observed that these seven categories of firms do differ from one other.

Table 12: Turnover Ratios and Analysis of Variance (ANOVA)

	F-Statistic	p-value
Trade receivables to Sales	30.832	.000
Inventories to Sales	117.504	.000

Source: Authors' Calculations

Table 13 reveals the results of homogeneous subsets which classify the companies into homogeneous groups. Alpha value of more than 0.05 indicates the acceptance of the null hypothesis that the companies in the same column do not differ significantly. Three subsets are defined in with respect to ratio of trade receivables to sales with a significant value of more than ten ($p > 0.10$).

Table 13: Turnover Ratios and Homogeneous Subsets

Size of the Public Limited Companies	Ratio of Trade receivables to Sales			Ratio of Inventories to Sales					
	N	Subset for alpha=0.05			N	Subset for alpha=0.05			
		1	2	3		1	2	3	4
2	3	12.43			3	13.56			
3	3		17.03		3		15.70		
5	3		17.96	17.96	3			17.23	
4	3		18.10	18.10	3			17.33	
1	3		18.43	18.43	3			17.40	
6	3		18.73	18.73	3			17.43	
7	3			19.56	3				19.66
Sig.		1.00	.134	.176	Sig.	1.00	1.00	.979	1.00

Source: Authors' Calculations

Four subsets are defined with respect to ratio of Inventories to Sales with a significant value of more than ten ($p > 0.10$). This reveals that the seven categories of firms differ significantly with respect to their turnover ratios.

Findings and Conclusion

The data which is collected for the study is normally distributed and the variance is equal among the seven different categories of public limited companies. Analysis of variance indicates greater difference among the different categories of public limited companies with respect to their profitability, expenditure and turnover positions. With a significance value of more than 0.05 they differ from one another except in case of ratio of profit after tax to net worth. From this we can conclude that the large size firms are grabbing up the opportunities of being big in terms of high profits. They are enjoying economies of scale in terms of reduced expenses. Efficiency is also observed in case of turnover ratios which is a measure for the relationship between the level of activity and the usage of assets. Hence, it can be inferred that the size of a company in terms of total assets plays a major role in determining its financial performance, soundness and health.

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