

A Study on Segment Reporting Practices on Select Power Sectors in India

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Abstract

Segment reporting is the process of disclosing details about a company's core clients, overseas operations and export sales, and operations across several industries. A company that reports in segments gives stakeholders access to more information and enhances the Calibre of decisions they make. Analysts and other financial statement users feel that segment information is crucial for evaluating and forecasting the performance of the company. This study aims to shed light on the specific power sectors' segment reporting procedures. Starting in 2018 and ending in 2022, the current study spans five years. Secondary data collection methods were employed by the researcher. Websites, periodicals, journals, magazines, and annual reports are the sources of the secondary data. The study employed panel regression and average as statistical methods. The STATA software program has been utilized to conduct statistical analysis. The study's goal is to examine the power industries segment report in relation to the business segment. The study's hypothesis is that segment revenues and segment results for the power industries do not significantly differ from one another. Additionally, the Hausman test revealed that the Random Effect Model fits this data the best, thus it should be chosen for the study.

Keywords: Business Segments, Segment Reporting, Segment Result, Segment Revenue.

Introduction

Segment reporting is the act of classifying the financial statements of an organization or a set of organizations into discrete categories according to sales, revenues, as well as profits, as well as industry and regional markets. As they may differ with regard to profitability, development potential, and risk, large firms with multiple product lines as well as marketing sectors obviously need segment reporting to highlight different areas. Investor assessments of corporate companies are aided by information about the segment. Investors could evaluate the company's growth, risk, cash flows, and profit potential. Additionally, assessing internal management and developing regulations tailored to particular segments will benefit the company's management (1). Assessing the overall performance and potential of an organization is the ultimate goal of every user of financial statements. When it comes to this task, diversified businesses face a greater challenge than those with a single line of business. Sales growth and profitability factors can be identified using segment data. Segment data serves as the foundation for a more thorough assessment and

projection of a business's future growth than is feasible to obtain from publicly available data. Infosys's Financial Services and Insurance segment had the highest average revenue, the lowest risk, the greatest consistency, and the fastest growth rate throughout the course of the study, with the Life Sciences and Healthcare segment coming in second. Infosys' Energy Utilities and Telecommunication division achieved the second-highest average income, with a consistent growth rate of -0.553 (2). With the exception of cross variability of segment return the researcher discovered that there was no meaningful relationship between segment reporting quality and equity capital costs when IFRS (International Financial Reporting Standards) were implemented (3). The author concluded that a decentralized management structure must be implemented as the organization grows (4). The research indicates a considerable reduction in the number of businesses reporting segment income under IFRS 8, which may indicate a loss of segment income data (5). Book value, Earning per share and total

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segments all contribute to the explanation of share price fluctuations (6). The disclosure policies of Indian Listed Companies in a few industries were investigated with relation to primary and secondary segments (7). Following the implementation of IFRS 8, a sample of 150 companies' financial statements was analyzed, and the researcher concluded that there had been a shift in the segmental information disclosed (8). Implementing IFRS 8 on European blue chips; the authors discovered a large rise in the number of reporting businesses (9). The author discovered that, in comparison to the coarser segment reports based on the original AASB 1005, the more disaggregated or finer reports based on AASB (Australian Accounting Standards Board) 114 provide users significantly greater confidence (10). In their paper *Segment Reporting Practices: A Malaysian Perspective*, the researcher found that some Malaysian enterprises' financial reporting practices lack segmental reporting (11). The implementation of SFAS (Statement of Financial Accounting Standards) No. 131 led to a finer division of businesses' operating activities, a decrease in analyst forecast errors, and enhanced monitoring (12). In their comparative study on segment reporting in India and outside, the researcher concluded that most organizations in both countries simply reveal the requirements on segment reporting (13). Segment reporting has become a pivotal component of financial disclosures, providing disaggregated information on a company's operations. It enables stakeholders to gauge the financial performance of different business segments, thus improving transparency and facilitating informed decision-making. In the context of corporate financial disclosures, existing literature highlights the importance of segment reporting for enhancing transparency and accountability, particularly in complex industries where multiple revenue streams exist (14). Regulatory mandates, such as IFRS 8 and Ind-AS 108, have further institutionalized segment reporting as a standard practice, requiring companies to provide clear insights into the financial health of their distinct business segments (15). As one of India's most vital sectors, the power industry operates under significant regulatory control, with companies often managing both traditional fossil fuel-based and renewable energy segments. The twofold pressures of complying

with regulatory mandates and navigating the energy transition make segment reporting particularly pertinent for understanding the financial performance of different operational units within power companies (13).

Conceptual Framework

In the recent past a large number of studies have been conducted on segment reporting practices. In India the number of studies on segment reporting especially with reference to Power Industries is very less so, there has been a huge scope to make study on segment reporting practices on top 20 power sector companies on the basis of market capitalization for the period of 2018 to 2022 as there is few studies on these companies for this period. The power sector in India is heavily regulated with government policies driving much of its growth and restructuring. Segment reporting in this context could reveal how companies report financial performance across business units influenced by varying regulatory environments. The power industry is of particular interest to institutional investors, policymakers, and stakeholders. Segment reporting practices in this sector have the potential to significantly impact investment decisions. The power sector faces unique challenges such as regulatory pressures, capital intensity, and the transition to renewable energy have not been thoroughly examined in the context of segment reporting. This study fills that gap by focusing specifically on how segment disclosures impact transparency and investor decision-making in the power industry. The study investigates the role of segment reporting in improving financial transparency and its ensuing impact on investor decision-making within the Indian power sector. By offering more detailed and disaggregated information on segment performance, segment reporting allows investors to better evaluate the profitability, risks, and future prospects of individual business units, thereby equipping investors with more precise information to make informed decisions regarding their investments, resource allocation, and risk management and enhancing their ability to make well-informed investment decisions. This research analyzes how investors react to segment revenue and segment result disclosures, providing empirical evidence on whether transparency at the segment level significantly affects investor confidence and decision-making. The study aims to

examine the segment report of a chosen Power Industry in relation to its business segment and investigate the correlation between the segment revenue and result of that particular Power Industry. By concentrating on the Indian power sector, the study contributes insights into how segment reporting influences financial transparency and investor behavior in an industry that plays a pivotal role in India's economic development. The following hypothesis was developed for the study: H₀₁: There are no significant differences between segment result and segment revenue of power industries.

Methodology

Utilizing previously published literature, exploratory research was carried out for this study. The yearly reports, journals, magazines, newspapers, and websites are the sources from which secondary data is gathered. The period of the study covers five years ranging from 2018 to 2022. The study consists of Top 20 power sector industries as per their market capitalization Listed by BSE. This research investigation relies on

secondary data sourced from the Trendlyne stock market platform. The researcher has used statistical tools like AVERAGE, Panel Regression. Panel regression is a statistical modeling method that analyzes data that has both cross-sectional and time series components. Panel Regression has been recognized and utilized by various researchers in prior studies (16-31). For carrying out statistical analysis STATA 15 application package has been used. Sample units taken for the study are ADANI, NTPC, Power Grid, TATA Power, NLC India, Jaiprakash Power, Reliance Infra and NAVA. The firms included in the sample were chosen based on their compliance with regulatory standards, availability of comprehensive segment reporting, and their relevance to current industry challenges.

Results

Hypothesis1:H₀₁: "There are no significant differences between segment result and segment revenue of power industries". The following tables (Table 1, 2) show the segment revenue and segment result of selected power industries during the period 2018 to 2022.

Table 1: Companies Average Segment Revenue (32-39)

Year	2022	2021	2020	2019	2018
ADANI	3752.5	3308.767	3805.333	2435.167	1314.833
NTPC	69644.3	59458.35	57933.75	52078.5	44483.15
Power Grid	14142	13593.96667	12877	11908.5	10181.26667
Tata Power	15484.36667	12050.06667	10837.6	11134.3	9353.033333
NLC India	8625.75	7232.6	8089.6	7431.25	8523.9
Jaiprakash Power	1277.275	907.825	1196.633333	1403.866667	1731.733333
Reliance Infra	6183.2	7465.3	6827.833333	6358.566667	6152.133333
NAVA	965.15	773.7	836.75	880	710.875

Table 2: Companies Average Segment Result (32-39)

Year	2022	2021	2020	2019	2018
ADANI	1153.833333	1068.1	1026.6	658.6333333	748.8666667
NTPC	15263.45	13986.25	14982.25	8335.05	10719.6
Power Grid	7898.433333	8131.533333	8082.833333	5692.266667	6904.433333
Tata Power	2231.633333	1960.366667	2062.433333	2013.466667	1263.433333
NLC India	1449.85	992.25	1318.9	714.3	1470.3
Jaiprakash Power	336.95	321.175	316.7333333	480.7	626.3666667
Reliance Infra	825.0666667	2355.366667	1239.633333	1047.733333	1142.666667
NAVA	203.875	164.925	180.675	251.025	141.425

To study the relationship between segment revenue and segment result we carry out OLS Regression Analysis. In this analysis, the segment

result was treated as the dependent variable, while segment revenue was the independent variable. The five years information of independent variable

and dependent variable has been pooled to have a panel data and afterward pooled OLS regression

has been applied on it. The following Tables (Table 3, 4, 5) summarize the results of the above analysis.

OLS Analysis: OLS Regression Model

Segment Result = $\alpha + \beta_1$ Segment Revenue + ϵ

Table 3: OLS Analysis

Source	SS	Df	MS
Model	610897814	1	610897814
Residual	121529380	38	3198141.59
Total	732427195	39	18780184.5

Table 4: OLS Analysis

Number of Observation	40
F(1,38)	191.02
Prob>F	0.0000
R-Squared	0.8341
Adj R-squared	0.8297
Root MSE	1788.3

Table 5: OLS Analysis

Segment Result	Co.Ef.	Std. Err.	t	P>t	[95% Conf. Interval]
Segment Revenue	.2237052	.016186	13.82	0.000	.1909382 .2564721
_cons	429.0329	348.4818	1.23	0.226	-276.4316 1134.497

The results of OLS Regression analysis exhibit that the p-value of segment revenue i.e. 0.0000 is less than the level of significance i.e. 0.05. Thus the variable segment revenue is significant to influence the segment result at 5% level of significance. The R Squared value (0.8341) exhibits that segment revenue explains 83.41% variance in the segment result. While the R-Squared value gives an indication of the explanatory power of the model, it is also crucial to consider the Adjusted R-squared value. The gap between R square and Adjusted R Square value is less, which is a sign of good model specification. A small difference

typically suggests that the model is well-specified effectively capturing the essential dynamics between the independent variable and segment result. Overall, these results underscore the significance and reliability of the regression model, demonstrating that the selected independent variable collectively provide a substantial explanation for variations in the segment result. The statistical significance along with the balanced nature of the panel data and the model's good specification, contribute to a robust understanding of the factors influencing segment result.

Fixed Effect Model and Random Effect Model

Table 6: Fixed Effect Regression Model

R-sq:	
Within	0.5203
Between	0.8541
Overall	0.8341
Corr(u_i, xb)	-0.1993

Table 7: Fixed Effect Regression Model

Number of observation	40
Number of groups	8
Observation per group:	
Minimum	5
Average	5.0
Maximum	5

F(1,31)	33.63
Prob>F	0.0000

Table 8: Fixed Effect Regression Model

Segment Result	Coef.	Std. Err.	T	P>t	[95% Conf. Interval]
Segment revenue	0.2421777	0.0417634	5.80	0.000	0.157006 0.3273548
Cons					
sigma_u	1730.7348				
sigma_e	820.19645				
rho	0.81660525				

Under the Fixed Effect Model (Table 6, 7, 8), the analysis yielded an F stat of 33.63 and prob>F value of 0.0000 which is less than the level of significance i.e. 0.05. It means that all the coefficient of the model is not equal to 0, suggesting that each variable has a meaningful impact on the dependent variable. It means that the model is good and nicely fitted, making it a reliable tool for understanding the relationships between the variables. Thus, it may be concluded that the segment revenue variable plays a substantial role in explaining the segment result.

Therefore, the model as per OLS Analysis:

Fixed effect Regression

Segment Result=C+β₁ Segment Revenue_{it}+ε_{it},

Segment Result=196.5794+0.2421777 Segment revenue+ ε_{it}

Overall, the model demonstrates that the independent variable collectively provide a robust explanation of the variations in segment result. The significance of the coefficients and the model's overall fit indicate that it is a well-specified and effective model for analyzing the factors influencing Segment Result.

Table 9: Random Effect Regression Model

R-sq:	
Within	0.5203
Between	0.8541
Overall	0.8341
Corr(u _i , x)	0 (assumed)

Table 10: Random Effect Regression Model

Number of observations	40
Number of groups	8
Observation per group:	
Minimum	5
Average	5.0
Maximum	5
Wald chi2(1)	70.26
Prob>chi2	0.0000

Table 11: Random Effect Regression Model

Segment result	Coef.	Std. Err.	z	P>z	(95% Conf Evaluation)
Segment revenue	0.2316545	0.0276362	8.38	0.000	0.177489 0.28582
_cons1	329.001	728.0795	0.45	0.651	-1098.01 1756.011
sigma_u	1793.5324				
sigma_e	820.19645				
rho	0.8270406				

In the Random Effect Regression model (Table 9, 10, 11), the analysis results in a prob>chi2 value of 0.0000 which is below the level of significance i.e. 0.05. It means that all the coefficient of the model is not equal to 0. In other words, the coefficients in

the model are statistically significant, signifying that each independent variable has a meaningful impact on the dependent variable. It means that the model is good and well-fitted, providing a reliable representation of the relationships

between the variables. Consequently, we can say that a significant portion of the segment result may be explained by the segment revenue variable. Therefore, the model as per OLS Analysis- Random effect Regression

$$\text{Segment Result} = C + \beta_1 \text{Segment Revenue}_{it} + z'iy + \tilde{\epsilon}_{it}$$

$$\text{Segment Result} = 329.001 + 0.2316545 \text{Segment Revenue} + z'iy + \tilde{\epsilon}_{it}$$
 Overall, the model provides a well-specified and effective framework for understanding the factors that influence the Segment Result. The statistical

significance of the coefficients, combined with the model's good fit, indicates that it is a reliable tool for analyzing the impact of the selected variable on Segment Result.

Hausman Test

The Hausman Test (Table 12, 13) is used to differentiate between fixed effect model and random effect model in panel data.

H₀₁: The preferred model is random effect

H₁: The preferred model is fixed effect

Table 12: Hausman Fixed

	Coefficient			
	(b)Fixed	(B)Random	(b-B)Difference	sqrt(diag(V_b-V_B)) S.E.
segmentrev~e	0.2421777	0.2316545	0.0105232	0.0313117

Table 13: Hausman Fixed

Chi2(1)	0.11
Prob>chi2	0.7368

The following table reveal that Prob>chi2 value is 0.7368, which is greater than the significance level of 0.05. As a result, the null hypothesis is rejected, which indicates that the model has random effects, rather than fixed effects. Therefore, the Random Effect Model is considered the most effective fit model. The results of Hausman test imply that the Random Effect model is more suitable for this study. The Hausman test is used to distinguish between fixed effect model and random effect model in panel analysis. As per the findings, Random Effect model is considered the best fit for analysing the data in this study. This model allows for individual-specific effects that vary across entities but remain constant over time, which is particularly useful when dealing with panel data. The Random Effects model provides a more generic approach, assuming that the individual entity's error term is not correlated with the explanatory variables, thereby allowing the results to be more widely applicable. In concise, the Prob>chi2=0.7368 and the outcome of the Hausman test both point to the conclusion that the Random Effect Model should be preferred for this analysis. This model offers the best fit for the data, providing a well-grounded framework for understanding the relationships between the variables in the study.

Discussion

This study concentrates on analyzing the segment

reporting disclosure practices within a selected sample of Indian power sector companies. The central hypothesis of the study propounds that there is no significant difference between segment revenue and segment results. Through rigorous statistical analysis, this hypothesis was validated, providing key acumen into the relationship between these two financial metrics. The Ordinary Least Squares (OLS) regression analysis was inked to divulge the relationship between segment revenue and segment results. The findings disclosed that the p-value for segment revenue was below the significance threshold of 0.05. This specifies that segment revenue is statistically significant and has a meaningful impact on the segment results at a 5% significance level. The low p-value, notably recorded as 0.000, further underscores the significance of segment revenue in explaining variations in segment results. In substance, this finding suggests that segment revenue is a strong predictor of segment results, thereby rejecting the initial supposition of no significant difference. The wholesomeness of the model was further established through additional statistical tests. The Prob>chi2 value was found to be 0.0000, which is beneath the significance level of 0.05. This result shows that none of the coefficients in the model are equal to zero, asserting that the model is well-fitting and of high quality. The low Prob>chi2 value strongly

recommended that the model accurately captures the relationship between the independent and dependent variables, ensuring the reliableness of the findings. Although when evaluating the appropriateness of the model, the study found that the null hypothesis could not be rejected. This conclusion was drawn based on the Prob>chi2 value of 0.7368, which exceeds the 0.05 significance level. This result suggests that the random effects model is more preferable for this dataset, as it better accounts for the variability within the data that is unexplainable by the fixed effects model. To verify this, the Hausman test was applied, which further stipulated that the random effects model is the best fit for the data in this study. The Hausman test is a pivotal step in determining whether a fixed or random effects model should be used in panel data analysis. The test results in this case clearly favored the random effects model validating its use in examining the relationship between segment revenue and segment results within the Indian power sectors. In abridged, the study provides compelling substantiation that segment revenue significantly influences segment results, contradicting the inceptive hypothesis. The OLS regression analysis, supported by a low p-value and robust model fit, validated the importance of segment revenue in financial reporting within the power sector. Additionally, the Hausman test results underscore the appropriateness of the random effects model for this analysis, ensuring that the findings are both reliable and pertinent to the broader context of segment reporting practices in the Indian power sector. This study thus put up valuable insights into the financial reporting practices of Indian power companies, focusing on the critical role of segment revenue in shaping segment results. The Study discloses segment revenue and segment results, which could influence comparability, transparency and variations among companies within the sector. The study reports profitable segments and less profitable ones, thus affecting how investors perceive risk and potential. While the adoption of Ind-AS aims to standardize financial disclosures, variations may still exist due to differing interpretations and implementation practices among companies. The depth and detail of segment reporting can vary widely among power companies. While some firms provide comprehensive breakdowns of segment revenues,

results, and risks, others may offer only minimal data, making cross-company comparisons difficult.

Conclusion

Reporting by segments is a useful exercise from stakeholders' point of view. They would have access to disaggregated data of high value which helps them in resolving many intricate issues in appraising corporate performance. The segment information would reveal the profitable and non-profitable areas of business activities, the relative contribution of each segment to overall growth and development, firm's strength and weaknesses, etc. The efficient running of the Company depends on evaluating the segmental performance. The aforementioned analysis revealed a positive relationship between segment revenue and segment result. The regulatory authorities, such as the Ministry of Corporate Affairs (MCA), should introduce more explicit guidance on segment identification. This would help ensure consistency across companies, making it easier for investors to compare segment performance within and across sectors. Regulatory bodies should introduce a mandate for companies to disclose segment-specific risks, such as regulatory risks, market risks, and operational challenges, in their financial statements. This would help investors assess not just the financial performance but also the potential future risks associated with each segment.

Abbreviations

B: Beta Value, T Value: Table Value, P Value: Probability Value, OLS: Ordinary Least Square, GLS: Generalized Least Square, NTPC: National Thermal Power Corporation, NLC INDIA: Neyveli Lignite Corporation Limited, IFRS: International Financial Reporting Standards, AASB: Australian Accounting Standards Board, SFAS: Statement of Financial Accounting Standards.

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Author Contributions

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Conflict of Interest

There does not exist any conflict of interest in

regard to the research project, according to the authors.

Ethics Approval

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