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# Evaluating Financial Performance of Public and Private Power Distribution Companies in Gujarat: A Decade-Long Comparative Analysis

**Anjali Patel**
*Research Scholar Swaminarayan University, Kalol*

**Dr. Nirav Gajjar**
*Research Supervisor Swaminarayan University, Kalol*

## Abstract
DISCOMs are the bloodstream of the Indian power industry and since they are so in the prosperously industrialized Gujarat, India watershed industrial powerhouse. Despite the huge reforms implemented and advancements made, DISCOMs have continued to bear financial and operational challenges, in other words, the losses due to AT&C, regulatory and debt overhang. To this end we juxtapose the comparative financial performance of the leading DISCOMs in Gujarat (PGVCL, UGVCL, DGVCL, MGVCL-Public sector and Torrent Power and MGVCL- Private sector) over a period of ten years (FY 2013-2023). The impressive multi-methods research intensifies the study by using ratio analysis, trend analysis and benchmarking, as the tool to analyze firm profitability, liquidity, solvency and efficiency of operations. Impressive conclusions are that there is a contrary comparison in the financial fitness between the public and the privately owned DISCOMs and certain systemic ineffectiveness. The analysis and conducted research will also have evidence-based policy propositions which can be used to improve financial sustainability and policy propositions, which can be made corresponding to Gujarat vision on energy. Our business touches upon many stakeholders involving regulators, DISCOM management, investors, or researchers interested in enhancing the robustness of the power sector.

## Introduction
Electricity is an imperative factor of economic growth, enhancement of technology and an improved living standard. In the developing economies such as that of India, the energy sector is the master key to the total development of the country in terms of industrial productivity, agricultural growth and urbanization. Other sectors that are important in the chain of electricity value include the power distribution sector, which is the final arm of the chain in the transmission of the power to the end-users. The performance of the electric power sector to a major extent is linked to the efficiency, financial viability and financial efficiency of the Distribution Companies (DISCOMs) which directly has an influence on the reliability as well as affordability of supply of the power to the households, industries and the infrastructure of the public sector.

Known to be one of the most urbanised as well as industrialised states of India, Gujarat has been a quick offender in the spirit of energy reform. Following the division of the Gujarat Electricity Board (GEB) in 2003 following the GEA 2003, the state was left with a single state DISCOM-the Gujarat Urja Vikas Nigam Limited (GUVNL), which was further divided into four state DISCOMs namely, Dakshin Gujarat Vij Company Limited (DGVCL), Madhya Gujarat Vij Company Limited (MGVCL), Paschim Gujarat Vij Company Limited (PGVCL), and Uttar Gujarat Vij Company

Besides these public utilities, one of the major players of the privatized sector, Torrent power has been in operation since long in limited number of urban centres, hence, providing a very interesting figure of comparison between the performance of public and the privatized sector.

Over the past ten years, Gujarat DISCOMs have been working in a still developing energy sector characterized by the growth of renewable energy production, the development of policy frameworks, and the spread of smart-grid projects and the increasing power consumption. Although almost all the utilities have been electrified, these utilities still face chronic problems which include high AT&C losses, chronic debt issues, regulatory deficiency that has resulted in unequal tariff costs and inadequate infrastructure that have eroded its financial strength. The other complexities are the delays in subsidy payments, the politically based tariff choices and the comparatively high prices of acquiring the renewable generation resources.

The current financial position of DISCOMs needs a detailed comprehension of the health of the Indian power sector to be successful in the long term. Previous studies conducted in the country and world over have emphasized the assessment of profitability, efficiency in operations, liquidity, solvency and industry wide concerns. However, there are few studies that compare them to each other, at least in one area that is of private and public utilities. The literature review will go over the literature available on financial performance measurement, the challenges that the DISCOMs face, and analytical frameworks used with the main focus on the papers carried out in the state of Gujarat and overall power distribution sector in India.

**Studies on Financial Performance in Power and Utility Sectors**

Numerous research studies have been carried out where financial indicators have been used to explore the performance of corporations in various sectors. An area of Adity Rai (2020) research concerning financial efficiency of Indian power-generating businesses has shown that the public-spent arm of businesses exceeded the number of parameters by a long way over the private business on a few upon a few indicators including, above all, both Return on Equity (ROE) and steadiness. Despite a study being restricted to the example of electricity production, the paper brings to light the value of systematic ratio-based approach applied in the field of energy. In a similar study, Sheela S. C. & Dr. K. Karthikeyan (2012) evaluated how competent Indian pharmaceutical product lines are in Saudi Arabia and used a DuPont analysis of Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM) to rank the outcomes of firms. A similar consequent touch to the operations came across at the thought of the authors as that of Dr. Anurag B. S. & Ms. Priyanka T. (2012), who compared Indian public DISCOMs with private banking institutions, viz. SBI and ICICI and found that the leading private banks topped the operating efficiency over the public DISCOMs with the stronger balance sheets.

**Key Financial and Operational Challenges for DISCOMs**

**Aggregate Technical and Commercial (AT&C) Losses**

AT&C losses which include stealing of the electricity, inefficiency in the billing systems and the infrastructure is in poor conditions is a long term issue. Shafat M. & M. Nasir Z. (2018) prove that such losses are positively linked to a decreased financial earnings and corporate reputation. Even though average AT&C losses in Gujarat (which is 6-15 per cent) is lower than the national average (22 per cent), significant variation exists between individual DISCOMs in Gujarat.

**Tariff-Cost Gaps and Regulatory Constraints**

As figures point out, literature explains that tariffs in a greater number of Indian states are not cost reflective, which implies that at regular intervals, distribution companies (DISCOMs) suffer financial losses. Another complication comes when the changed tariffs are not promptly notified and thus leave the DISCOMs to lack the planned subsidies which is to the worsening of liquidity pressures that they face. Such a case has been followed by all the reports of the NITI Aayog reports of 20192023, and it is also clearly mentioned in the article by Ghosh and Mondal (2009).

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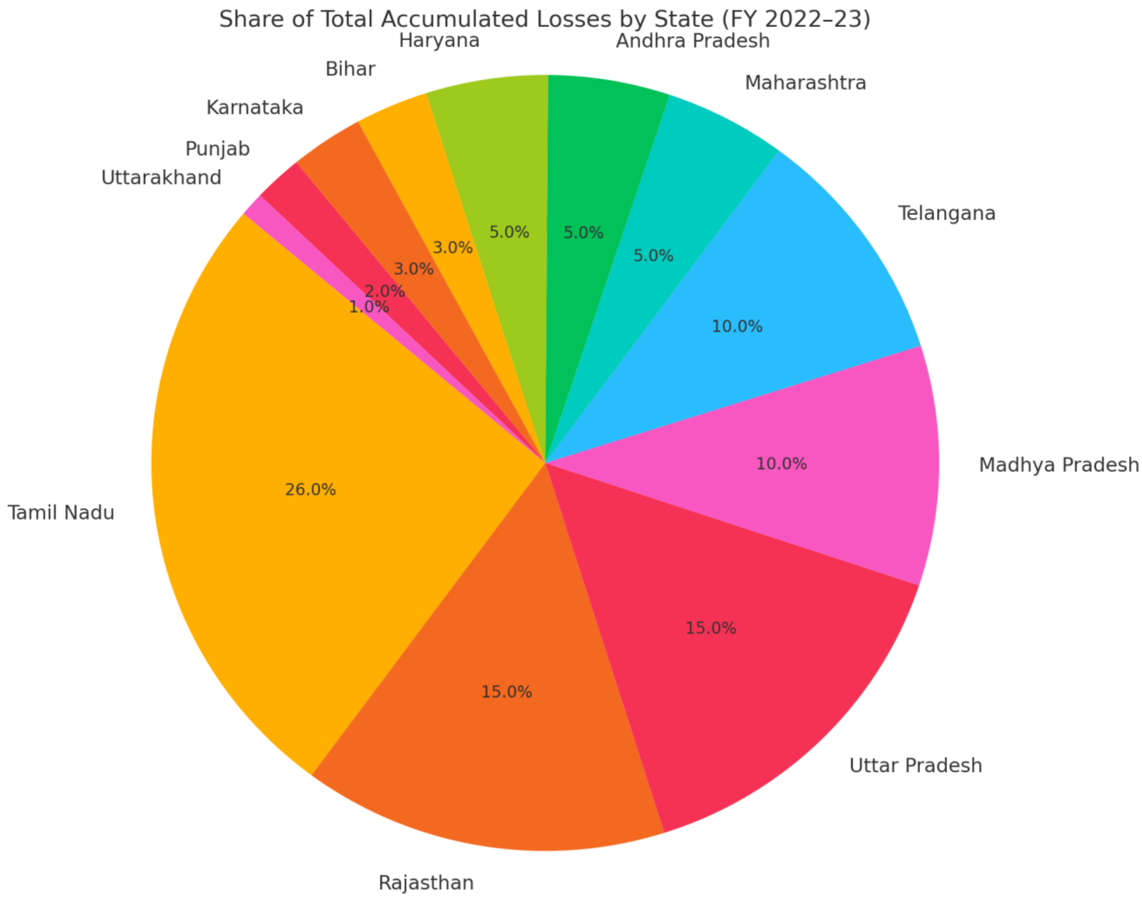



**Debt and Working Capital Management**

The Indian distribution companies (DISCOMs) are highly liquidity constricted and wield a languid working capital cycle. Some evidence of the UDAY programme shows that the debt restructuring will not boost their performance significantly: the operational efficiency must be worked on simultaneously. This result is corroborated by the empirical evidence of Fullerton & Wempe (2009) according to which operational efficiency is a precondition towards better financial performance.

**Integration of Renewable Energy**

Use of renewable energy brings in further complications through its inconsistent nature and the increased capital investment. Esma Nizam et al. (2019) received an empirical analysis to show that the ESG strategies affiliated with long-term financial performance can have a negative effect on the most significant financial measures (ROE or asset turnover) which could not be detected if not constantly surveyed.

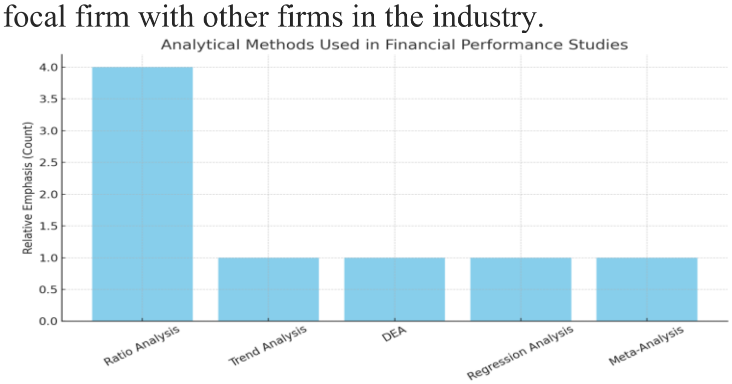
**Seasonal and Regional Variations**

According to the results of the empirical research by Chi and Gursoy (2009) and by Zawadi A. (2013), seasonal and economic features of the region such as high levels of demand during summer and outsourcing season at Gujarat have significant impacts on the operational income. Such results are of particular significance to agricultural and industrial areas served by DISCOMs like PGVCL and DGVCL.

**Analytical Methods Used in Financial Performance Studies**

The serious review of distribution companies (DISCOM) would require a multidimensional framework. Several analysis techniques have been formulated to be used in the utility industry presenting different information about profitability, liquidity, solvency and efficiency of operations. Those methods most commonly used in academic and industrial practice are described in the present discussion.

The most well-established methodology is financial ratios. In this case, basic values like the return on equity, the debt-equity ratio, debt-service coverage ratio, and the current ratio are determined and compared to the industry counterparts to establish their comparative positions. The industry benchmarking goes further in using both firm-specific variables and sectoral medians to actually make comparisons beyond financial statements. Econometric modelling attempts to explain the difference between financial outcomes through regression of financial variables on explanatory variables which include size of firm, output mix, cost structure and regulatory regime. Discounted-cash-flow methods use the present value of some future cash flows either deterministically or stochastically to estimate the value of the firm. Financial statement based event studies involve interpreting the performance effect on the value of a given firm in the event of occurrence of certain events- mergers and acquisitions, divestments, and changes in regulation by comparing market performance of the focal firm with other firms in the industry.




**Ratio Analysis**

Ratio analysis is a fundamental part of any financial performance measurement, as historically it has been applied to the evaluation of companies operating in various industries, such as energy, banking, manufacturing, etc. The method presupposes the determination of the ratios which are derived based on income statements of a firm, its balance sheets, and cash flow statements, and thus allows examining various dimensions of performance. Specifically, it allows the review of profitability, liquidity, solvency, and efficiency.

**Profitability Ratios**

Profitability ratios evaluate the ability of a firm in translating revenue, assets, or equity to net income. Among the key indicators is:
Net Profit Margin (NPM): The ratio of the revenue saved as net profit.
Return on Assets (ROA): It is the effectiveness with which the assets are utilized to earn incomes.
Return on Equity (ROE): The extent to which shareholders equity is convertible to profit making.

**Liquidity Ratios**

Liquidity ratios value the capacity of a firm to pay short-term liability. Useful actions are:
Current Ratio: This is the ratio between current assets and current liabilities and it gives an indication of short term financial positioning.
Quick Ratio: tighter version of a current ratio excluding inventory count the numerator and indicating the deeper liquidity position.

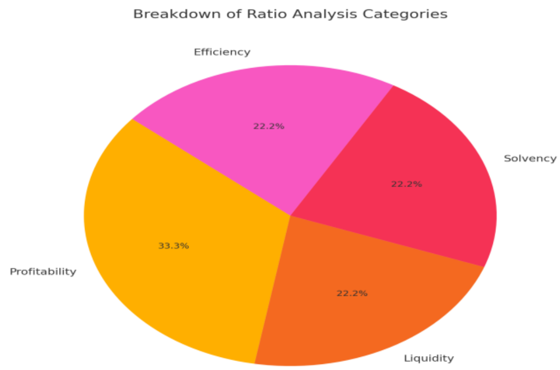
**Solvency Ratios**

The solvency ratios look at long-term sustainability and are geared up. Important metrics are:
Debt-to-Equity ratio: The ratio of debt funding rate over equity funding rate.
Interest Coverage Ratio: It is the ability of a firm to comply with interest expenses.

**Efficiency Ratios**

Resource utilization is rated using efficiency ratios. They are relevant indicators:
Asset Turnover: The effectiveness of the assets to create sales.
Collection Efficiency: In case of DISCOMs, the extent by which revenue is recovered among customers.

DuPont analysis was utilized by Ahmed A. A. (2012) to value the financial situation of the Arab banks in terms of stability, whereas CAMELS rating and ratios analysis was applied by Anita M. & Shveta S. (2013) to consider the health of Indian commercial banks.

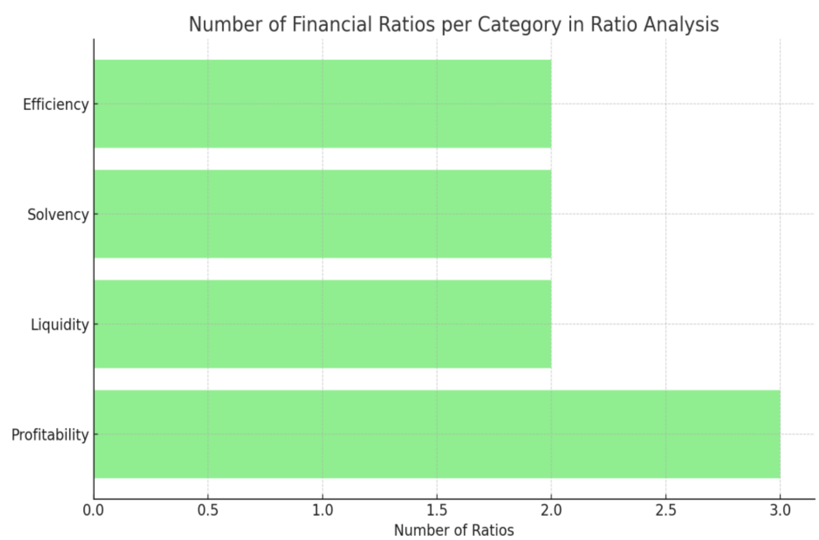



**Trend Analysis**

Trend analysis in its simplest form is tracking the financial statistics over a period of years to identify fixed trends, periods of cycles or the consequences of a conscious thought-out strategy or policy play. Such a line of analysis is especially useful in the sector of a public utility where significant legislative interventions, like the Electricity act of 2003 or the UDAY scheme, have massive impacts on the management level decision-making as well as their relative success.

Ghosh and Mondal (2009) in their analysis of the Indian technology and the Indian pharmaceutical sectors used the trend analysis in tracing the course of the intellectual capital and financial performance. This methodology preconditioned identification of small yet stable changes in financial indicators, not mentioning identification of inflection points and their correlation with policy initiatives or macroeconomic changes.

In the case of Gujarat DISCOMs, trend analysis would allow comparison of financial and operating indicators such as AT&C losses, operating margins, and revenue collection in pre-reform and post-reform situations. This type of comparative analysis enables strategic forecasting and long term planning as it can reveal such latent expenditure patterns, debt patterns and capital investment patterns.




**Data Envelopment Analysis (DEA)**

Data Envelopment Analysis (DEA) is a non-parametric approach to the analysis of relative efficiency of decision-making units (DMUs), i. e. firms or public utilities, that compares inputs and outputs on a multidimensional base. The highlight of its appeal lies in the fact that there is no definite premise about the functional form that the underpinning production phenomenon takes which makes it particularly appropriate in evaluating the efficiency of functioning of heterogeneous subjects.

As it builds an efficiency frontier using the most effective units, DEA enables consideration of less efficient companies against best performers, which is very valuable, especially when comparing performance between different operational models of DISCOMs in heterogeneous geographical input conditions (a comparison between public and private DISCOMs, especially).
In the studies they conducted, Yalcin et al. (2012) first evaluated Turkish manufacturing enterprises by using fuzzy multi-criteria DEA in rankings of companies in the financial directions, whereas Dr. Tesfatsion (2016) deployed DEA in determining the effectiveness of African banks thus indicating the gaps that ratio analysis had not met.

As the case of the Gujarat DISCOMs, DEA will be applied to identify those firms that are efficient in converting the input (staff, acquired electricity) into outputs (sold energy and revenue collected) which allows designing proper investment strategies and actualizing reforms in operations.

**Regression and Correlation Analysis**
Two of the main methodological approaches in this regard are regression analysis and statistical correlation, which are used to measure and explain the link between two or more variables, dependent variables, such as measures of meeting financial margins, and independent variables, such as operational inefficiency, debt levels and fluctuations in revenues collection (AT&C losses). These methods allow practitioners to measure the extent of correlation between the explanatory variables and the outcome measure they feel they are interested in enhancing by revealing the direction, and the strength of causal effects.

Simple Regression is a process involving estimation of the effect brought about by one independent factor and state it on an economic parameter like net profit or liquidity. Multiple Regression uses the same concept on two or more independent variables giving a more detailed diagnosis tool to be used to examine a more detailed chain of causes.

Analysis of Correlation which estimates the magnitude and direction of the relationship between variables acts as a trial set of hypotheses before the hypotheses are brought to more rigorous scrutiny of multivariate models.

The research conducted by Uadiale (2010) demonstrates the usefulness of regression in enlightening about the impacts of the board composition on the firm performance in Nigeria. In another similar study, Maditinos et al. (2011) facilitate the roles that the intellectual capital plays towards the market value and the profitability of Greek firms using the multiple regression technique. The two studies confirm that this methodology allows identifying the systemic forces that are otherwise difficult to detect by means of other ratio-based diagnostics.

In the power sector, regression can be used to determine the implication of factors like AT&C losses, similar dependence on subsidies or discretionary spending in financial terms, like the return on asset (ROA) or current ratios, among others, to policymakers. Such analysis will help in prioritizing the measures of reform by approximating the magnitude of respective effects
In the case of distribution companies (DISCOMs), especially those that incorporate sustainability and renewable energy, meta-analysis may help Debunk any ambiguity on whether their investments in CSR, green energy or community electrification are having any practical returns (financial or otherwise). It also gives the foundation of policy development since it makes it easy to compile information in the various cross countries/cross sector studies.

All the above analytical tools provide a different look into the financial performance of the power distribution companies. Radio analysis and trend analysis provide a benchmark on performance. Data envelopment analysis (DEA) reveals commercial inefficiency, regression analysis recognizes the capital campaign, and meta-analysis minimizes the dissonance between sustainability and profitability. Combined, all these methods should be considered as a framework of evaluation of DISCOMs concerning a mixed structure like in Gujarat.

**Identified Research Gaps**
Notwithstanding this much studies and literature scrutiny on the power sector in India, three distinct gaps are observable in the existing body literature. To begin with, the distribution segment remains to be ignored despite being one of the most important points of contact between the generation and consumption of electricity. Second, regional differentiation has not been used adequately in analysis yet these distinctions are key in understanding institutionally and sociopolitically heterogeneous settings. Third, studies involving financial and operating measures have been carried out in isolation; there is a need to have a more linked up approach between the two dimensions. These gaps are covered in the current research statement where the focus is laid on distribution, regional diversity, and interplay of financial performance and operational effectiveness.

**Underexplored Distribution Segment**
The general literature available on the electricity sector notes an extreme asymmetry in academic coverage such that an extensive amount of research has been done on power generation and long-distance transmission rather than on power distribution companies (DISCOMs). Whereas the profitability of various generation corporations has been analyzed, investment rates maintained, and the processes of shift toward sustainability in progress, the DISCOMs, also the most financially vulnerable and structurally complex of all, have been given little attention by the analysts.

**Lack of Region-Specific Analysis**
Leading studies on DISCOM performance today normally have an aggregate view, at the national/state levels, and fail to reflect the infrastructure, heterogeneous regional and institutional environments of the Indian power sector. These widely used methodologies expose them to the danger of yielding results that, unfortunately, cannot be applied on a uniform basis to the varied

Indian electricity markets. The state of Gujarat, as an example, is notable both in the existence of privately run as well as publicly owned utilities, namely Torrent Power, and its condition of being a surplus in electricity generation- a condition typified by relatively low AT&C losses and increased industrial electricity demand. Such unique structural features demand the specialised Gujarat-specific examination instead of generalities of the whole nation. Without such establishment of localized analysis, scholars and policymakers still experience a major knowledge gap to recognize how particular policy regimes, the structure and tendency of consumer behaviors, and regulatory policies emerge in the states.

## Conclusion

The current research on the financial state of companies creates a number of robust analytical methods that are to be operationalised to investigate corporate health, specifically ratio analysis, trend analysis, regression models, and the efficiency benchmarking methods (among which Data Envelopment Analysis (DEA)). These tools have been used in various areas such as the banking industry, manufacturing industry, even power generation industry but there still exist fundamental gaps limiting them to the distribution utilities in India.

The distribution segment, though it plays a huge economic role, stands out in this category as it has not been keenly addressed within the academic circles with much attention compared to the other segments. Besides, though there is still no firm-level or Gujarat-specific study yet, the current composition of the Gujarati market is unique as it reflects a combination of both private and state DISCOMs. In addition, the comparative analyses that are available are national meaning that they do not take into consideration the contextual differences hence lack significance in regional policy making. Lastly, the not-so-well integrated operating and financial data in most of the studies already presents a partial picture of the causal mechanism behind financial results.

The current study is an attempt to fill these gaps by carrying out a decade-long, region-wise and ownership-structured comparative study of the DISCOMs in Gujarat. The inclusion of financial performance ratios and the operational performance and the application of analytic tools like trend analysis and DEA act as the empirical basis and framework of solution presented by the study to the appraisal of DISCOM sustainability. It is expected that the findings will guide a wide network of stakeholders including policymakers, regulators, DISCOM managers, investors, and academic researchers by reflecting on performance disparities, operations parameters and best practices. The combination modus operandi once again will promote data-informed decision making decisions and the reshaping of the sector into financial and functional sustainable management.

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