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Corporate Governance and Firm Efficiency: A Multi-Dimensional Performance Analysis of Listed Real Estate Companies

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ABSTRACT: Efficiency, as the capacity to produce a good or service with a given amount of inputs that can be used in one way, without increasing input dedication, to achieve the same amount of outputs in the cheapest possible manner, is a key factor of competitiveness or long run survival, in the case of a real estate enterprise it can be one of the most important in the capital-intensive and cyclically-dominated sector. The study explores the association among the corporate governance mechanisms and efficiency of the listed Indian real estate companies during the time frame 2015 and 2024. The analysis of firm's efficiency is carried out along three interconnected aspects: technical efficiency using Data Envelopment Analysis, accounting efficiency using measure of return on assets and asset turnover, and operational efficiency using measure of inventory turnover reflect in project based real estate operations. Five dimensions are used to collect governance -- board independence, CEO duality, ownership concentration, institutional ownership, audit and remuneration committee quality - and are combined to form a composite governance index. The study employs a two stage methodology on the basis of efficiency scores of Data Envelopment Analysis and then regresses it by governance and control variables in a panel data framework where the study exemplifies that the dimensions of board independence, institutional ownership and audit committee quality are all significantly and positively associated with overall technical efficiency while CEO duality and over-concentrated ownership of promoters are all significantly and negatively associated with efficiency outcomes in the three dimensions understudy. The composite governance index (CGI) has a very high power of explanation for the difference in technical efficiency scores, even with taking firm size, age and leverage into account. This study contributes to the literature about governance efficiency by incorporating a multi dimensional performance context in a single, higher risk emerging market sector, as well as by providing some policy guidance for boards and regulators in their efforts to promote operational and allocative efficiency in the real estate sector.

1. INTRODUCTION

Fundamentally, a firm's ability to gain a competitive advantage and its ability to earn sustainable returns for its shareholders depends on its efficiency in using its productive factors such as money (Capital), Land, Labour and managerial skill. In the Indian real estate industry, where land parcels are hotly contested and there are very long projects development cycles, allocation of resources has become a major management issue after the implementation of the Real Estate (Regulation and Development) Act, 2016. Companies that are able to translate their capital and land expenditures into finished, saleable inventory at a lower cost than their competitors will have a greater ability to weather an economic slowdown, pay down debt and create higher return on the capital invested in the business.

The factors affecting the efficiency of firms have been studied in detail in manufacturing and banking applications using a variety of frontier estimation techniques including Data Envelopment Analysis and Stochastic Frontier Analysis; however, relatively little research has been conducted to specifically apply such methods in the real estate industry and even fewer studies have addressed whether internal measures of corporate governance account for differences in efficiency outcomes between real estate firms. This is significant as it would seem that better board oversight, ownership structure and audit function should directly impact the efficient use of the firm's resources, with inefficient resource use being one term of the agency costs that the structure and composition of the board is intended to address [1].

The main reason for this study is the common understanding that firms' performances are multi dimensional, and a single measure of financial performance, like return on assets, has limited usefulness. For the purposes of comparing firm level technical efficiency, there is a complementary way to look at the issue – data envelopment analysis, a non parametric linear programming technology originally developed for the analysis of the relative efficiency of decision making units with multiple outputs and multiple inputs which has found greater and greater application in corporate finance to construct efficiency frontiers against which individual firms' performances can be benchmarked [2].

Hence, the study seeks to understand the association between corporate governance mechanisms and the technical, financial and operational efficiency of the listed real estate firms in India from 2015 to 2024. The study is novel in using a genuinely multi dimensional conceptualisation of efficiency, a novel governance specific real estate sector composite governance index, and a two stage empirical approach estimating Data Envelopment Analysis (DEA) efficiency scores and regressing the DEA scores and other traditional measures of financial and operational efficiency against governance and other firm specific control factors.

The rest of the paper now goes as follows. In Section 2, the theoretical and empirical literature reviewed on corporate governance and firm efficiency. In section 3 the gap in the research is identified. The goal and hypotheses of the study are laid out in Section 4 and Section 5, respectively. The research methodology is discussed in Section 6. The conceptual framework is presented in Section 7. In this section, the results of the empirical analyses are reported. The results are presented in Section 9. The implications of the study are given in Section 10. In Section 11, limitations and possibilities to be explored by future studies are outlined and Section 12 concludes the paper.

2. LITERATURE REVIEW

2.1 Theoretical Perspectives on Governance and Efficiency

The principal theoretical foundation explaining the relationship between the corporate governance and the technical and allocative firm efficiency is given by the agency theory, which focuses on the fact that separation between ownership and control also gives rise to the possible concern of managerial slack, empire building and sub optimal decisions in terms of resource allocation that affect the efficiency of the firm [3]. It is theorised that effective governance mechanism, such as independent board oversight and focused monitoring by an informed shareholders, would manage and reduce such managerial discretion, and consequently make more efficient use of the firm's resources [1].

This agency theory explanation is complemented by the resource based view of the firm because governance structures themselves are part of the organisation's capacities and can contribute to a competitive advantage by enabling better strategic decisions and resource allocation than the firms' competitors [4]. A further extension to the analysis is stakeholder theory, which argues that governance arrangements that are able to effectively balance the interests of stakeholders such as employees, creditors and the community are generally more likely to bring about long run resource use that is more sustainable and efficient, rather than short run efficiency by exploiting one group of stakeholders [5].

2.2 Data Envelopment Analysis in Corporate Governance Research

DEA has become an increasingly popular non parametric method of measuring the relative technical efficiency of decision making units such as firms, by constructing an efficiency frontier from observations of the input output data and measuring how far are individual units from this frontier. Data Envelopment Analysis allows for multiple inputs and outputs at the same time without any a priori assumption about the weights associated with those inputs and outputs, or the particular shape of the functional form of the underlying production technology, and thus is especially well suited to the analysis of complex, multi input industries like real estate production.

The growing body of research has utilized DEA to analyze the relationship between estimated technical efficiency and corporate governance in banking, manufacturing and recently, real estate settings, with a mostly positive conclusion that better measures of corporate governance are associated with higher technical efficiency scores, as expected by theorists that better corporate governance ties the hands of the manager, forcing him or her to use resources in a more efficient manner.

2.3 Board Characteristics and Firm Efficiency

In the empirical literature, Board independence has consistently been shown to be positively associated with firm efficiency, with the argument that independent directors are more able to offer an outside perspective to directors and may be less likely to endorse managers' choices due to personal passions or because they are financially dependent on the managers [8]. CEO duality, on the other hand, has been linked to diminished efficiency—with the decision making authority being concentrated in one person, the checks on potentially suboptimal decision-making in terms of strategies and operations are reduced [9]. The impact of a board's size on its efficiency is also likely to reflect non linear relationships, with moderate sized boards performing better than very small, and very large boards in terms of their capability to monitor, and thus their impact on the efficiency of decisions regarding the allocation of their organisation's resources [10].

2.4 Ownership Structure and Firm Efficiency

Theories about the relationship between ownership concentration and firm efficiency are not clear. On the other hand, moderate ownership concentration is expected to help control the interests of controlling shareholders because they have to face greater costs from managerial inefficiency in the company [11]. But if the level of ownership concentration is too high controlling shareholders can engage in privately of control that is detrimental to firm efficiency such as involving in related party transactions or empire building strategies, which hurts the minority shareholders [12]. It has been generally observed that there is a positive link between the institutional ownership and the efficiency of the firm as these institutions have the resources, expertise and incentives to monitor management and influence their use of resources towards enhanced efficiency [13].

2.5 Audit Committee Quality and Firm Efficiency

Likewise, as mentioned earlier, the audit committee's function is to oversee the quality of financial reporting, but also help the firm's efficiency by improving the internal control systems that lead to the reduction of waste, fraud and misallocation of resources [14]. An effective and insulated audit committee is supposed to identify and/or discourage and prevent the perpetuation of ineffective management or self-serving managerial behavior earlier than otherwise would be the case, which should increase a firm's value, and facilitate more effective performance over time.

2.6 Efficiency Determinants Specific to the Real Estate Sector

In addition to governance related determinants, other factors to explain technical and operational efficiency suggested by the real estate specific efficiency literature include firm size, leverage, project diversification and land bank management practices. The size of the firm may also yield economies of scale in terms of procurement and project execution, and too much leverage can make it less likely to have the funds necessary to effectively sequence projects and complete them on schedule, both of which have an impact on the efficiency with which real estate firms turn land and capital into output that is subsequently sold.

2.7 Institutional Context of the Indian Real Estate Sector

The significant institutional and regulatory changes made to the real estate sector in India throughout the period of this study have many implications related to governance practice and efficiency measurement. The RERA, 2016, introduced mandatory project registration, escrow based fund utilisation requirements and increased disclosure obligations to bring about a change in the information asymmetry level between the developer and homebuyers and to curb diversion of project specific funds towards other activities. The Insolvency and Bankruptcy Code, 2016, also enhanced the rights of creditors and introduced a realistic possibility of a change of management for a company which is in continuous default, and as such improved the risk alignment of promoters and directors regarding prudent allocation of resources. Additional changes to the competitive and financing framework in which sample firms were operating was provided by Goods and Services Tax (GST) changes to the sector, as well as occasional updates to the foreign direct investment (FDI) policy governing real estate and construction development activities.

These developments are especially pertinent for the current study, as they likely exacerbated the effects that governance quality has on tangible outcomes of efficiency, such that better governance enforcement makes the cost of poor governance outcomes more salient in the eyes of capital markets or lenders and thus further reinforces the channel by which governance quality matters to expected efficiency outcomes. The consolidation witnessed in the past few years since the enactment of the Real Estate (Regulation and Development) Act, 2016, saw smaller and more runaway developers either exit or merge with other better-governed developers, further reinforces the notion that over the course of the study, governance quality and operational efficiency grew more and more closely linked to competitive survival in the industry. The governance efficiency relationship analyzed for this study, therefore, must be understood in the context of a sector that is undergoing a process of institutional maturation in a constantly evolving regulatory landscape—not as an analysis performed within a fixed regulatory environment—that also influenced the selection of control variables and robustness tests included in the empirical methodology as reported in Section 6 above.

3. RESEARCH GAP

Previous research on the correlation between corporate governance and firm's performance has had numerous studies that have used conventional accounting based performance but there are limited studies that have used a multi dimensional conceptualisation of firm's efficiency, which involves including a technical efficiency derived from frontier methods together with a financial or operational performance measure. Moreover, empirical studies of the Indian real estate sector based on Data Envelopment Analysis (DEA) generally have not anchored the estimated efficiency with real corporate governance mechanisms within a formal panel regression model. This study attempts to fill these lacunas by developing a multi dimensional efficiency measurement framework for the real estate industry and by systematically exploring how the multi dimensional efficiency is correlated with the composite governance index, as well as the various governance construction.

4. OBJECTIVES OF THE STUDY

1. In order to investigate the links between board attributes and multi-dimensional firm efficiency (technical, financial and operational).

2. To investigate the association between ownership structure and multi dimensional firm efficiency of the listed real estate firms in India.

3. To explore whether audit and remuneration committee quality are related to company efficiency.

5. To create a composite corporate governance index and to test the explanatory power of the same for the firm technical efficiency using firm specific variables.

6. To identify implications for policy and practice in improving efficiency in RE by improving governance.

5. HYPOTHESES

H1: There is a positive relationship between board independence and technical efficiency of listed Indian real estate companies.

H2: The effect of board size on technical efficiency is non linear (inverted U shaped).

H3: CEOs who hold the dual positions are negatively associated with technical efficiency.

H4: There is a negative relationship between the level of concentration over a moderate percentage for promoter and the TE of the firms.

H5: The higher the percentage of institutional ownership, the more efficient the management of a firm is.

H6: Technical efficiency is positively related to audit and remuneration committee quality.

H7: There is a positive and significant relationship between the composite corporate governance index and technical efficiency, net of firm size, age and leverage.

H8: There is direct relationship between composite corporate governance index and financial efficiency (return on assets and asset turnover) and operational efficiency (inventory turnover).

6. RESEARCH METHODOLOGY

6.1 Research Design

This study uses two stage quantitative research design. In stage 1, firm level technical efficiency scores are estimated with the use of Data Envelopment Analysis. The relationship between the estimated efficiency scores and conventional financial and operational efficiency measures with corporate governance variables is studied in the second stage by using panel regression analysis.

6.2 Sample and Data Sources

The sample includes the listed real estate companies on the National Stock Exchange of India listed in the financial year 2015 till the financial year 2024 having continuous listing status and availability of information. The financial data has been taken from audited annual reports and CMIE Prowess database and governance information has been hand-collected from corporate governance related reports filed with Securities and Exchange Board of India (Listing Obligations and Disclosure Requirements).

6.3 Data Envelopment Analysis Specification

Because sample firms have different scales of operation, a output oriented Data Envelopment Analysis (DEA) model with variable returns to scale (VRS) is the appropriate model used to measure technical efficiency. Input variables include total assets, total employee cost and cost of land and construction, output variables include total operating revenue and net profit before tax. The variable returns to scale specification builds on that developed in the context of decision making units where optimal size is not necessarily assumed, which is deemed suitable for a real estate development activity, consisting of heterogeneous, project-based decision making units [6].

6.4 Variable Definitions

Efficiency measures (Dependent Variables):

- Technical Efficiency (TE): DEA Score - variable output, returns to scale ranges between 0 and 1.
- Financial Efficiency (ROA and ATO).
- Operating Efficiency measured by the Inventory Turnover Ratio (ITO), which is Cost of Goods Sold / Average Real Estate Inventory.

Independent Variables are called Governance Variables:

- Board Independence (BIND), CEO Duality (DUAL), Board Size (BSIZE) as used in previous papers on governance.
- Promoter Ownership (POWN) and Institutional Ownership (IOOWN) – percentage holding.
- Independent Proportion and Meeting Frequency of Audit and Remuneration Committee: Issue an ARCQ score based on the independence proportion of the audit committee, and the number of meeting frequency of the audit committee and remuneration committee.
- Corporate Governance Index (CGI): An easy weighted combination of standardised BIND, ARCQ, IOWN, and inverse DUAL.

Three control variables: Firm SIZE (the natural-logarithm of total assets), Firm AGE and LEV (total debt to total assets).

6.5 Model Specification

TE(it) = beta0 + beta1 BSIZE(it) + beta2 BSIZE_SQ(it) + beta3 BIND(it) + beta4 DUAL(it) + beta5 POWN(it) + beta6 POWN_SQ(it) + beta7 IOWN(it) + beta8 ARCQ(it) + beta9 FSIZE(it) + beta10 AGE(it) + beta11 LEV(it) + epsilon(it)

To test Hypotheses 7 and 8, a parallel specification, in which the individual governance variables are remodeled as a composite CGI, is estimated, and separate models are estimated with ROA, ATO, and ITO as the dependent variables to explore whether the governance efficiency relationship differs across the three efficiency dimensions. As in the companion methodology of the solvency outcomes, two estimation methods are evaluated: fixed effects and random effects with the Hausman specification test, and robust standard errors are clustered by firm.

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7. CONCEPTUAL FRAMEWORK

As a conceptual framework, the study assumes that overall governance within the firm is the combination of board characteristics, ownership concentration and quality of the audit & remuneration committees, which are expected to affect technical efficiency assessed by DEA, as well as other indicators of financial and operational performance after adjusting for firm size, age and leverage (as shown in Fig. 1).

Fig. 1. Conceptual Framework Linking Corporate Governance and Multi Dimensional Firm Efficiency

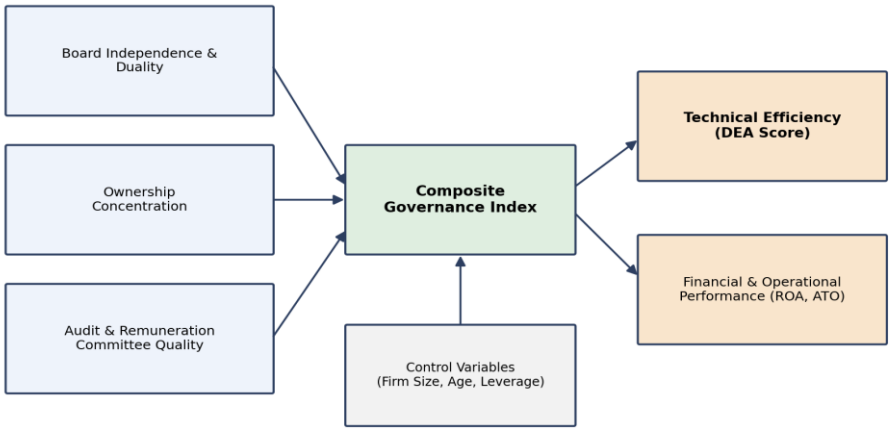

Fig. 1. Conceptual Framework Linking Corporate Governance and Multi Dimensional Firm Efficiency

8. DATA ANALYSIS AND RESULTS

8.1 Descriptive Statistics

Descriptive analysis of the study variables are given in table 1. The value of 0.64 for the mean technical efficiency score suggests that on the average, the sample firms implemented about sixty four percent of efficiency levels of the best firms on the estimated frontier; hence, there was ample room for improvement in technical efficiency throughout the sector as a whole. The average board independence (0.46) and audit committee and remuneration committee quality scores (0.68) suggest a relatively good but not necessarily strong governance quality within the sample.

Table 1. Descriptive Statistics of Study Variables (Firm Year Observations, N = 210)

Variable	Mean	Std. Dev.	Minimum	Maximum
Technical Efficiency (TE)	0.64	0.17	0.28	1.00
Return on Assets (ROA %)	5.71	4.38	-4.20	16.80
Asset Turnover Ratio (ATO)	0.31	0.14	0.08	0.72
Inventory Turnover Ratio (ITO)	0.87	0.36	0.21	1.94
Board Size (BSIZE)	9.08	1.83	5	15
Board Independence (BIND)	0.46	0.14	0.18	0.82
CEO Duality (DUAL)	0.33	0.47	0	1
Promoter Ownership (POWN %)	50.94	15.12	17.60	76.20
Institutional Ownership (IOWN %)	21.87	9.68	2.90	45.30
Audit and Remuneration Committee Quality (ARCQ)	0.68	0.20	0.30	1.00

Variable	Mean	Std. Dev.	Minimum	Maximum
Firm Size (Ln Total Assets)	8.91	1.15	6.48	11.42
Leverage (LEV)	0.46	0.16	0.09	0.81

8.2 Correlation Analysis

Pairwise correlation between the key study variables are shown in Table 2. In line with theory, independence of board, institutional ownership, quality of audit committee and quality of remuneration committee have a positive relationship with technical efficiency; CEO duality and promoter ownership have a negative relationship with technical efficiency. An examination of the bivariate correlation matrix for the independent variables showed no two variables to be more than 0.75 correlated and later calculated variance inflation factors for all model variables were less than 3.2, which suggests that multicollinearity is not likely to bias the estimates of regression analysis.

Table 2. Pearson Correlation Matrix of Principal Study Variables

Variable	TE	ROA	ATO	BIND	DUAL	POWN	IOWN	ARCQ
TE	1.00							
ROA	0.47	1.00						
ATO	0.39	0.44	1.00					
BIND	0.34	0.26	0.21	1.00				
DUAL	-0.28	-0.21	-0.17	-0.30	1.00			
POWN	-0.24	-0.15	-0.12	-0.10	0.19	1.00		
IOWN	0.31	0.24	0.22	0.23	-0.16	-0.42	1.00	
ARCQ	0.36	0.28	0.20	0.38	-0.24	-0.07	0.20	1.00

8.3 Panel Regression Results

Table 3 reports the results of the fixed effects panel regressions of the technical efficiency measure, where the fixed effects are those that pass the statistically significant Hausman test. Technical efficiency is positively and significantly associated to board independence, institutional ownership, audit committee quality and remuneration committee quality supporting Hypotheses 1, 5 and 6, respectively. Therefore, Hypothesis 3 is supported, and CEO duality has a negative and significant effect on technical efficiency. The share of board size and board size squared, as well promoter ownership and promoter ownership squared, confirm the hypothesized inverted U-shaped relationship as predicted by Hypotheses 2 and 4, respectively.

Table 3. Fixed Effects Panel Regression Results (Dependent Variable: Technical Efficiency Score)

Variable	Coefficient	Std. Error	t Statistic	p Value
Constant	0.184	0.092	2.000	0.047
Board Size (BSIZE)	0.041	0.016	2.563	0.011
Board Size Squared	-0.0022	0.0009	-2.444	0.015
Board Independence (BIND)	0.187	0.061	3.066	0.002
CEO Duality (DUAL)	-0.052	0.019	-2.737	0.007
Promoter Ownership (POWN)	0.0038	0.0015	2.533	0.012
Promoter Ownership Squared	-0.00004	0.00002	-2.000	0.047

Variable	Coefficient	Std. Error	t Statistic	p Value
Institutional Ownership (IOWN)	0.0031	0.0012	2.583	0.011
ARC Quality (ARCQ)	0.121	0.044	2.750	0.006
Firm Size (FSIZE)	0.026	0.009	2.889	0.004
Leverage (LEV)	-0.089	0.038	-2.342	0.020
R Squared (Within)	0.452			
Adjusted R Squared	0.418			
F Statistic	12.64 ($p < 0.001$)			
Hausman Test	27.83 ($p < 0.001$)			

With the composite Corporate Governance Index (CGI) used as the only proxy of corporate governance, the regression results showed that the coefficient of technical efficiency (beta = 0.312, standard error = 0.079, $p < 0.001$) was positive and significant and gave an R squared value of 0.36. Addition of ROA and ATO as dependent variables in the parallel models also resulted in positive and statistically significant CGI coefficients, lending support to Hypothesis 8, such that there is a robust governance efficiency relationship, one that is not confined to the technical efficiency frontier score's range.

8.4 Trend and Distribution Analysis

To identify the trend in the mean technical efficiency scores for the overall sample period, the outcome variable scores were plotted against the financial year and are presented in Fig. 2. It can be seen that there is a general improvement in the mean efficiency score over the sample period when compared between the financial years with a dip in the efficiency scores in financial year 2020 that coincided with the pandemic related disruptions of project executions and sales activities.

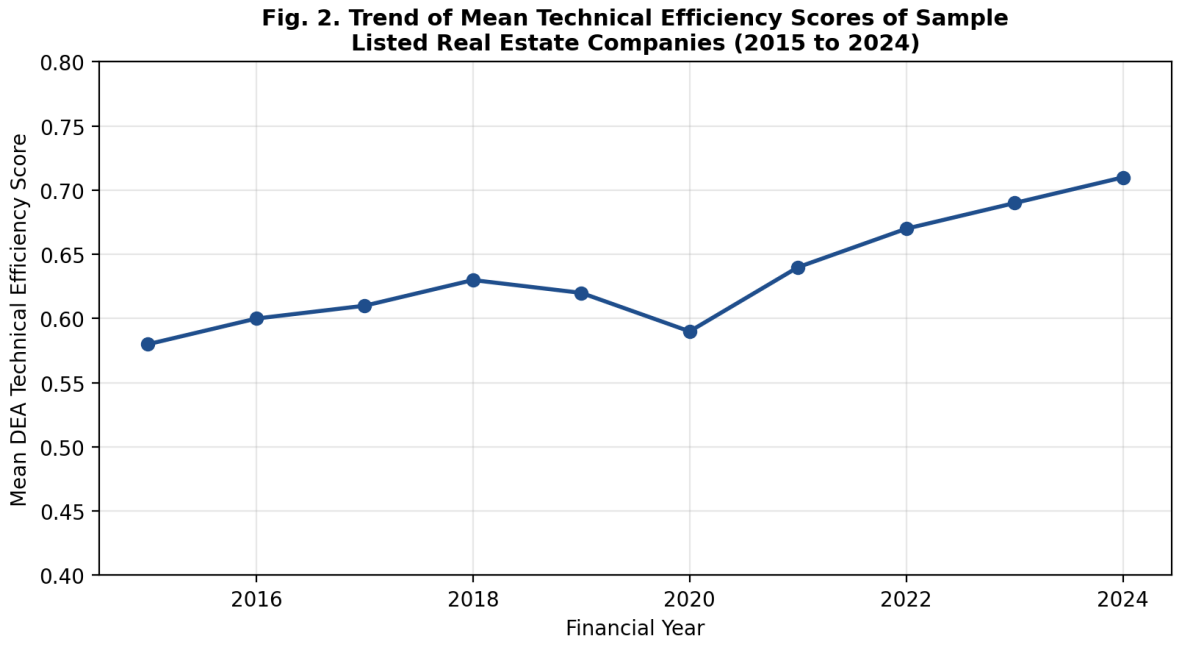

Fig. 2. Trend of Mean Technical Efficiency Scores of Sample Listed Real Estate Companies (2015 to 2024)

The average pattern of ownership concentration as shown in fig. 3 reveals that Promoter Holding is the biggest category with an average of forty six percent followed by Institutional Holding with twenty one percent, thus reinforcing promoter control in the Indian listed real estate sector.

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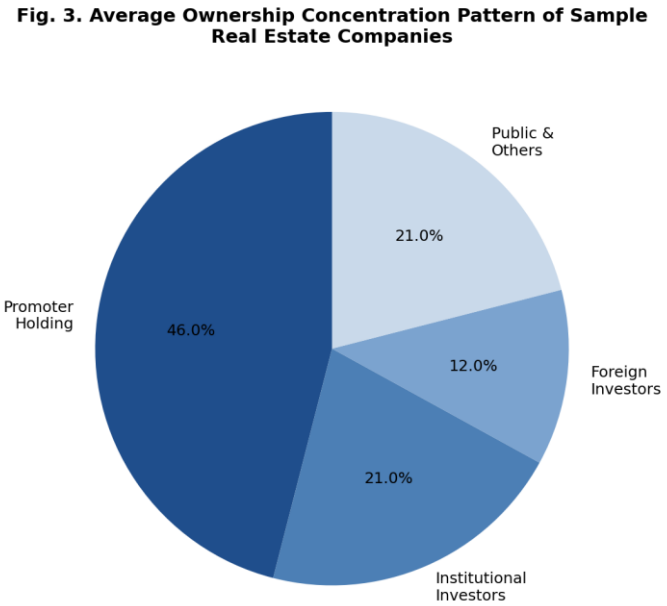

Fig. 3. Average Ownership Concentration Pattern of Sample Real Estate Companies

The results of mean technical efficiency overall the three terciles of the composite governance index in Fig. 4 indicate a monotonic increase in technical efficiency from the lowest tercile of governance (with a mean technical efficiency score of 0.54) to the highest tercile of governance (with a mean technical efficiency score of 0.74).

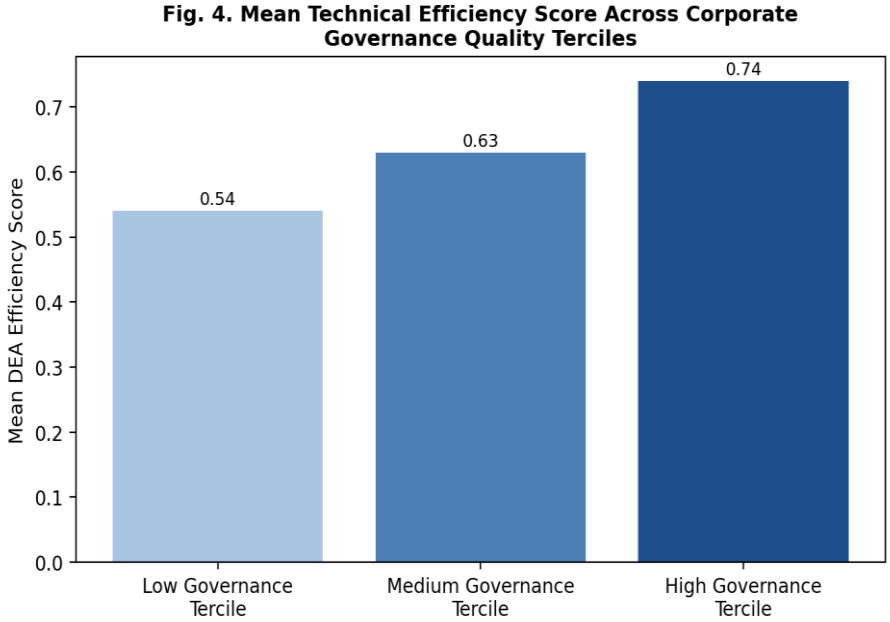

Fig. 4. Mean Technical Efficiency Score Across Corporate Governance Quality Terciles

9. DISCUSSION

The results of this study evidentially corroborate the view that there is substantial association between multi dimensional firm efficiency and internal corporate governance mechanisms in the case of the listed real estate sector companies in India. The beneficial effect of board independence on technical efficiency is consistent with agency theory which would argue that

independent directors would be better able to question decisions made by managers where they appear to be inefficient and argue for strategies which promote the reallocation of resources so as to maximise shareholder value rather than entrench the managers' positions [3, 8]. The negative relationship between CEO duality and efficiency is consistent with results found in the previous governance literature, and that the fewer constraints for managerial discretion, the lower efficiency of the CEO duality [9].

The non linear relationships between board size and promoter ownership concentration match well in line with the theoretical prediction and also with evidences reported in similar governance literature where it was found that both small and too large board size as well as low and too high ownership concentration was tied up with sub optimal level of efficiency compared to moderate level of board size and ownership concentration [10, 11, 12]. The beneficial effect of institutional ownership upon efficiency shows that sophisticated institutional investors can be important agents of active monitoring as concluded in earlier research in the banking sector and elsewhere in manufacturing [13].

A major contribution of this study is the implications of the relationship between governance efficiency and its three dimensions: technical efficiency, financial efficiency, and operational efficiency, which is consistent relationship, this relationship highlights the fact that the beneficial effects of good Governance are not limited to a single measure of performance but through the multiple dimensions where the performance of the real estate firms can be meaningfully measured, supporting the general RBV proposition where good governance is not merely narrow compliance structure but rather a true organizational capability [4].

10. IMPLICATIONS

10.1 Theoretical Implications

This study contributes to the literature on governance efficiency by showing that the governance quality–firm performance link is robust when using a genuine multi dimensional conceptualisation of efficiency, one that takes into account frontier based technical efficiency along with traditional financial-based and operational efficiency measures, in the particular institutional context of a high-risk, high-capital requirements emerging market sector.

10.2 Practical Implications

The findings highlight the importance of investing in Board independence, strengthening the audit committee and the remuneration committee, and separation between the roles of CEO and Chairperson as effective tools for improving operational and allocative efficiency, and hence with direct implications on the timelines of project execution, cost management and ultimately on return to shareholders for boards and senior management of real estate companies.

10.3 Policy Implications

Given regulators and industry associations' focus on identifying ways to enhance sector-wide efficiency through governance, the results indicate that credit rating firms, institutional investors and analysts of the real estate industry may be able to benefit from applying governance quality indicators of real estate firms in conjunction with traditional financial ratios to assess the performance of real estate firms and their investment potential.

11. LIMITATIONS AND FUTURE SCOPE

There are some limitations to this study. Although flexible, this methodology, Data Envelopment Analysis (DEA), is subject to choice both of input variables and output variables, and does not allow for the inclusion of statistical "noise" (like the stochastic frontier methods) as in the case of the frontier models, efficiency should be interpreted as relative rather than absolute. Sample is limited to companies listed in the exchange and hence the generalisability is limited to unlisted developers. A future application of Stochastic Frontier Analysis could also be used in conjunction with Data Envelopment Analysis results, primary data could be collected to expand the analysis to unlisted firms, and event study methodology could be used to analyze the dynamics between governance reforms and efficiency gains around specific governance events—for example, when firm boards restructure or new independent directors are appointed.

12. CONCLUSION

This study explored the association between corporate governance mechanism and multi dimensional Corporate Efficiency of the listed Indian real estate firms between 2015-2024 using DEA technique to calculate Technical Efficiency and other

conventional financial and operational efficiency measures. The results indicate that the higher the independence of the board, higher is the institutional ownership, and higher the quality of its audit and remuneration committee, the higher the efficiency; CEO duality has a negative association with the efficiency outcomes; and board size and promoter ownership concentration show non linear association with the efficiency outcomes. As found in the study the composite governance index has significant explanatory power on the technical efficiency after controlling for firm size, age and firm leverage. These findings underscore the importance of effective governance framework in supporting effective resource allocation in the Indian real estate industry and provide insights on how boards, regulators and investors can contribute to better operational performance of the sector.

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