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UNDERSTANDING CGDP AND ITS IMPACT ON FINANCIAL PERFORMANCE OF MANUFACTURING AND SERVICE SECTOR COMPANIES USING ONTOLOGICAL-BASED MECHANISM

Sunita Rani[1], Narinder Kaur[2]
[1]Research Scholar, Punjabi University, Patiala, India, ranisunita9901@gmail.com
[2] Principal, Shanti Tara Girls College, Malerkotla, Punjab, India, batra.narinder10@gmail.com

Abstract- Corporate governance is used to describe the processes, customs, policies, laws and institutions that direct companies to administer and control their operations. When these companies disclose their financial aspects to stakeholders in order to understand the state of affairs and futuristic developments, it is termed as corporate governance disclosure practices (CGDP). It is necessary to have good corporate governance in a company for ensuring higher productivity and financial performance. Thus, the given paper examines the level of CGDP and its impact on financial performance of manufacturing (automobile and cement) and service (banking and IT) sector companies in India for a period of nine years from 2014-2022. The firm performance measures include financial ratios along with mandatory and voluntary requirements for performing analysis. Financial ratios include return on equity (ROE), net profit margin (NPM), inventory turnover ratio (ITR) etc. whereas mandatory and voluntary requirements include board composition, stakeholder's interest, committees (audit, remuneration, nomination), chairman and CEO duality. Based on variables and requirements, the correlation coefficients are computed which shows positive impact on performance of the companies. In addition, the variables involving financial ratios as well as mandatory and voluntary requirements are represented in the form of Ontology thus providing futuristic layout of the proposed corporate governance framework.

Keywords- Corporate governance, disclosure practices, ontology and firm performance

1. Introduction

Corporate Governance is the application of best management practices, compliance of law in true letter and spirit and adherence to ethical standards for effective management and distribution of wealth and discharge of social responsibility for sustainable development of all stakeholders [1, 2]. The establishment of the corporate governance framework entails the allocation of rights and obligations among diverse stakeholders within the organization, and delineates the regulations and protocols for decision-making in corporate entities. Corporate disclosure is a process through which firms communicate all relevant information pertaining to the functioning of the company to their shareholders [3]. The major source of corporate disclosures is annual reports of the companies. A transparent, informative and strong corporate governance system is vital for getting approval and funds from firms in India as well as from abroad. Corporate governance disclosures practices (CGDP) adopted by a firm can influence the value of the firm by aligning the interests between the owners and the mangers. Such disclosures help management in mitigating expropriation in the form of high perquisites and excessive remuneration by making them more accountable for their actions [4, 5]. Higher disclosures can also enhance firm performance by inducing investor's confidence thus ensuring integrity, transparency and accountability.

The subsequent sections of the provided document are structured in the following manner. Sections 2 provides review of studies conducted in the context of CGDP related to manufacturing (automobile, cement) and service (IT, banking) sector companies. Section 3 describes methodology which involves identification of independent variable and dependent variable used for finding correlation and p-values in response to financial ratios. Section 4 provides results and discussions along with the proposed ontological-based corporate governance framework. Section 5 provides conclusion, novelty and future scope followed by references.

2. Related works

The authors in [6, 7] studied the impact of compliance with non-mandatory disclosures in corporate governance on the performance of Indian banks in the context of guidelines given by Securities and Exchange Board of India (SEBI) by constructing a self-index. The performance is measured using Return on Equity (ROE) financial ratio. The results of ordinary least square for a sample of 20 banking companies found evidence of a weak relationship between the corporate governance index and financial performance. In [8, 9], the authors developed a corporate governance composite index to analyse the impact of disclosure practices on firm performance measured by net profit margin (NPM), return on equity (ROE) and Tobin's Q of 10 Indian listed automobile companies during 2014-2019. The results of the ordinal logistic model showed that firm size and growth opportunities as measured by Tobin's Q had a significant and positive influence on Corporate Governance Disclosures. However, the results of their study found that no relationship exists between Corporate Governance Disclosure and financial performance as measured by ROE. It did not produce any correlation values with respect to ROE. Similarly, [10] et al. conducted a study on 'Corporate Governance and Financial Performance: Case Study of Indian Cement Industry' to find out the relationship between corporate governance index and financial performance of cement companies for a period of five years from 2013-14 to 2017-18. Ten sampled companies have been chosen on the basis of market capitalization and considered average board size, average independent directors as independent variables and average return on capital (ROC) employed as dependent variable. The findings revealed a positive relationship between corporate governance and financial performance among cement industries in India. A research was carried out in [11, 12] to look at how corporate governance affects business profitability. The S&P BSE SENSEX was used in the research as the analysis focus. According to the findings, there is no statistically proven link between corporate governance and a company's profitability. A similar study was carried out in [13, 14] to examine the annual reports of 30 listed companies in order to determine the extent of corporate governance disclosure by developing an index consisting of several parameters. The paper concluded that there was a significant difference between the quantum and quality of corporate governance disclosures made by the listed companies. Larger companies showed better extent of disclosure compared to smaller ones. Still, this study lacks correlation and p-values computation based on financial ratios. The authors in [15, 16] made an attempt to assess relationship between performance and governance index in the Indian automobile industry. To analyse the relationship, linear regression model as well as cross-sectional technique has been employed for during 2013-19. For analysis, two different measures have been used- net profit margin (NPM) and inventory turnover ratio (ITR). The time series analysis showed the positive relationship between firm performance and disclosure practices but cross sectional analysis showed no impact on financial performance of automobile companies.

3. Methodology

3.1. Sample and Data collection

This research is primarily focused on secondary data, which is taken from the respective websites and annual reports of the companies. The financial data (2014–15 to 2021-22) for a total of 40 companies—10 from each of the banking, IT, automobile, and cement sectors of India—has been chosen as a sample in this study. The reason for choosing those companies is the availability of data on financial performance.

3.2. Categorization of variables

They are categorized as shown in table 1.

Table 1: Description of variables, constructs and sub-constructs

Category	Constructs	Sub-constructs	Parameters
Independent	Corporate Governance Disclosure Index (CGDI)	Mandatory Voluntary	Board and its meetings, chairmanship and CEO, tenure and age limit, committees (audit, nomination, remuneration, stakeholders, risk management) Strategic information, quantitative information, qualitative and futuristic information
Dependent	Firm performance	Financial ratios	Return on equity (ROE), net profit margin (NPM), inventory turnover ratio (ITR), basic earnings per share (BEPS), return on assets (ROA) and debt to equity ratio (DER)

3.3. Steps involved in performing correlation analysis

- Structuring of data related to financial ratios of 40 sample companies during 2014-22.
- Compute corporate governance disclosure index (CGDI) for all 40 sample companies based on the following formula:

CGDI = [(Total score of a company) / (Maximum possible score achieved by the company)] * 100 (1)

- The corporate governance disclosure score used in the above formula is calculated on the basis of parameters involved in mandatory as well as voluntary requirements of the given company. Disclosure score of each item is assigned 1 or 0 otherwise.
- The value of CGDI obtained from equation 1 lies between 0 and 100 where 0 indicates worst disclosure and 100 represents the best disclosure practices adopted in the given company. This index only indicates existence of information in annual report of companies but the quality and extent of disclosure is estimated by performing correlation analysis.
- Now, the relationship between CGDI and financial performance of sample companies is analysed using one of the statistical tools i.e. correlation analysis.

4. Results and Discussions

In Table 2, we collate the values of CGDI computed based on disclosure scores for all 40 sample companies during 2014-22.

Table 2: CGDI computed for a sample of 40 companies

S.No.	Companies	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
1	Maruti Suzuki	88.43	87.12	87.67	84.32	88.12	82.67	80.12	84.56
2	Tata Motors	76.45	74.21	76.34	70.22	72.34	78.45	79.23	76.23
3	Mahindra & Mahindra	85.67	83.22	85.10	76.45	82.12	80.12	83.45	85.78
4	Bajaj Auto	91.23	90.15	91.10	83.45	84.56	86.76	88.97	91.12
5	Force Motors	83.66	84.65	83.66	81.23	83.56	87.12	76.88	83.45
6	Ashok Leyland	88.77	87.23	88.55	65.32	69.45	86.22	87.45	88.76
7	Hindustan Motors	92.78	91.67	92.35	89.45	84.56	82.12	83.45	92.22
8	TVS Motors	95.88	94.22	95.87	92.44	91.34	94.56	90.33	95.45

9	Eicher Motors	91.23	94.55	92.45	87.44	82.56	87.54	88.76	92.55
10	Hero Motocorp	67.32	74.45	66.89	45.67	78.76	83.34	69.76	70.43
11	Axis bank	45.67	67.76	55.78	69.12	75.87	79.55	84.34	86.32
12	Bank of Baroda	48.43	47.45	53.21	56.58	55.32	58.23	60.34	62.45
13	Bank of India	55.34	57.45	59.43	62.33	64.56	67.55	69.22	70.34
14	HDFC Bank	60.34	63.67	66.56	68.65	70.45	74.56	76.44	78.56
15	ICICI Bank	56.44	55.78	58.54	60.45	63.67	67.56	69.45	75.67
16	IndusInd bank	70.32	73.56	66.54	67.89	69.54	72.45	76.44	78.66
17	Kotak Mahindra	63.45	65.77	68.54	70.32	72.34	76.78	78.87	74.21
18	Punjab Nat. bank	56.34	57.88	59.56	64.78	66.88	69.43	74.56	76.88
19	State Bank of India	67.88	76.34	79.32	86.44	89.55	93.22	94.66	90.22
20	Yes Bank	67.34	66.78	68.65	70.43	72.45	75.67	78.87	73.21
21	HCL technologies	81.67	84.66	89.56	86.43	83.23	78.54	75.34	79.65
22	L & T	63.56	67.54	68.67	70.54	73.67	76.89	78.32	80.34
23	MindTree	66.87	63.23	67.77	68.67	69.65	73.66	78.45	73.54
24	Mphasis	70.45	76.45	72.33	71.34	73.78	78.66	76.33	72.87
25	Redington	72.56	74.67	76.88	78.98	71.34	67.55	68.77	65.43
26	TCS	67.54	68.43	72.45	74.67	76.88	79.67	84.66	87.34
27	Tech Mahindra	50.34	54.67	57.34	59.67	67.65	69.45	73.34	76.77
28	Infosys Ltd.	76.33	75.66	67.43	68.23	59.43	64.56	67.45	69.45
29	Wipro Ltd.	70.34	74.56	76.32	78.67	78.22	82.56	85.34	87.12
30	Hexaware technologies	45.65	46.78	48.65	49.56	58.43	65.46	68.54	70.32
31	Ambuja cements	57.34	59.45	65.34	67.45	69.54	70.23	72.45	76.77
32	ACC Ltd.	67.87	56.78	59.32	63.34	67.54	66.56	73.23	75.45

33	Shree cements	45.32	54.78	58.76	59.32	63.45	66.78	69.32	72.67
34	Dalmia Bharat	43.56	46.78	47.87	49.67	54.32	57.45	58.56	63.32
35	JK Cement	70.34	75.45	76.34	78.45	82.34	84.56	87.43	88.67
36	Ramco cements	67.45	56.89	54.22	67.66	70.12	71.23	74.56	78.65
37	India cements	65.32	67.32	70.12	73.56	76.78	79.45	80.34	83.12
38	JP Infratech	45.23	47.87	49.34	54.32	56.78	59.34	65.76	68.76
39	Birla corporation	55.98	67.32	69.34	73.45	76.87	77.56	85.32	86/44
40	Ultratech cement	76.54	69.77	65.43	78.54	72.12	78.67	80.21	81.45

Source: Authors' compilation

4.1. Correlation Analysis

Table 3 refers to the correlation of CGDI and financial disclosures of all companies during 2014-2022. It is found that CGDI shows positive relationship with CR, NPM, ITR, BEPS, ATR and DER for all the years. It can be observed that during 2017-19, the impact of financial disclosures are positive but not significant in nature. It is due to negative relationship of ROA and ROE with CGDI. Also, the impact of financial disclosures is positive and significant on the overall performance of the companies for all the years except 2017-18 and 2018-19.

Table 3: Matrix showing correlation values between CGDI and market based measures

→ Financial ratios ↓ Index	ROA	ROE	NPM	ITR	BEPS	DER
CGDI 2014-15	6.387	8.16	12.87	7.17	17.85	1.84
CGDI 2015-16	6.948	10.41	7.96	8.48	60.64	0.77
CGDI 2016-17	9.464	13.92	14.06	6.71	38.19	0.36

CGDI 2017-18*	5.162	-3.57	5.27	6.43	30.37	0.23
CGDI 2018-19*	-5.215	-19.77	13.3	5.21	25.72	0.34
CGDI 2019-20	3.071	5.73	5.26	6.26	27.07	0.68
CGDI 2020-21	4.226	5.71	15.57	7.34	29.44	0.47
CGDI 2021-22	7.434	6.21	11.32	5.66	34.66	0.59

Source: Authors' compilation (* indicates negative relationship between CGDI and financial ratios)

4.2. Hierarchical representation of variables

The variables involved in the study are shown in hierarchy mentioning classes and sub-classes of the proposed framework. The hierarchical representation is termed as Ontology [17, 18].

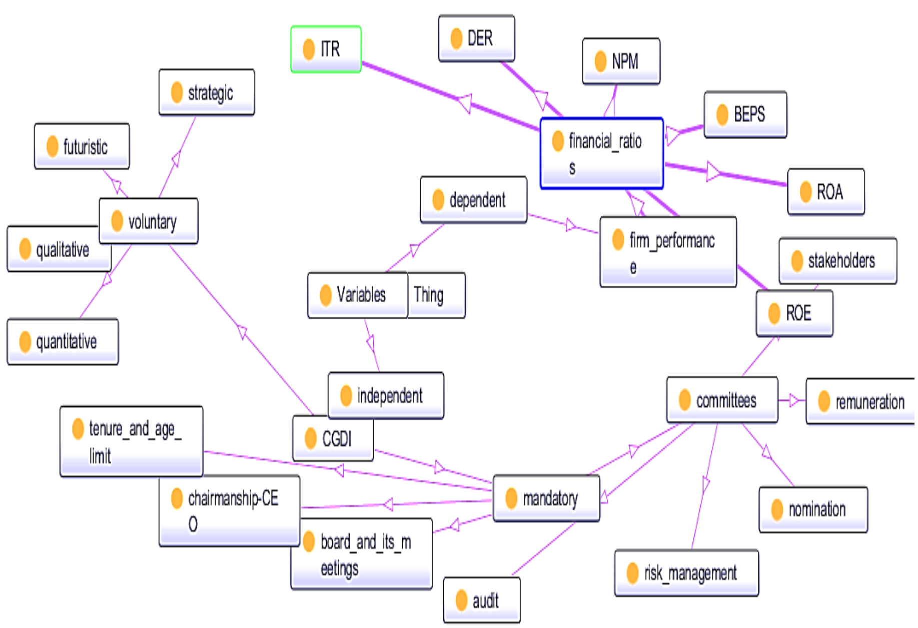

Figure 1: Conceptualized view of the proposed corporate governance framework

Figure 1 is designed using the application of artificial intelligence in corporate governance [19, 20], due to which it becomes easy to show relationships and decisions in the framework among organizations.

4.3. Gaps identified in existing studies

- The existing studies failed to derive any relationship (either positive or negative) between CGDI and ROE.
- Moreover, a number of studies have been conducted to understand the relationship between CGDI and market-based performance indicators, but further analysis related to the computation of correlation values for estimating the financial impact on companies needs to be studied.
- The existing literature also lacks the concept of ontology, which is useful in extracting relevant information based on the identified variables.

5. Conclusion, Novelty and Future Scope

The given paper presents an overview of corporate governance and its disclosure practices for a cluster of 40 manufacturing as well as service sector companies. It involves the formation of a corporate governance disclosure index (CGDI) for all 40 sample companies during 2014-22. The index is based on independent and dependent variables, which in turn consist of mandatory, voluntary, and market- based parameters. The corporate governance disclosure score is calculated on the basis of the above parameters, where the disclosure score of each item is assigned 1 or 0, otherwise. It is followed by an analysis of the relationship between CGDI and the financial performance of sample companies using one of the statistical tools i.e. correlation analysis. The results revealed that CGDI has an overall positive impact on financial performance, estimated either with market-based measures or voluntary or mandatory parameters. However, the results also revealed that corporate governance disclosure practices need to be improved, as not even a single company in the period of 9 years has attained a maximum value of CGDI (100).

5.1. Novelty and Future scope

The given paper provides the layout of a novel corporate governance framework by using the concept of ontology. The variables used in the formation of CGDI are represented in a hierarchical fashion, thus providing access to relevant information related to corporate governance for future organizations.
As a future scope, the proposed framework can be utilized for the formation of CGDI with control variables including but not limited to market-based, voluntary, and mandatory measures.

Conflict of Interests

There are no conflicts of interests associated with this study.

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