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Towards the Association of Voluntary Disclosures and Value of Firms: Evidence Revisited in India

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The information disclosed by the companies in their annual reports reveals much about company's performance and prospects. Investors take the information as base for decision for investment. Under such circumstance, companies choose to disclose beyond what is mandatorily required. Theories like agency theory, capital need theory and signaling theory support the need of voluntary disclosure. This study is about the relationship between voluntary disclosure and value of Indian pharmaceutical companies listed on World's oldest stock exchange, Bombay Stock Exchange (BSE). Objectives: Twofold : First, to investigate the extent of voluntary disclosure practices prevailing in pharma sector of India, Second, to study the impact of voluntary disclosure on Value of companies (value as measured by Weighted Average Cost of Capital, Stock Volatility and Price to Book Ratio) for the year 2010-2011 to 2017-2018. Research Methodology: To understand the extent of disclosure, a disclosure checklist is constructed and descriptive statistics are carved to reach the results. To understand the impact, Panel data regression (Fixed effect model, Random effect model, Hausman test) are run. Observation: Voluntary disclosure does not affect WACC but are negatively related to stock volatility and Price to Book Ratio in Indian scenario.

Keywords: voluntary disclosure, volatility, stock exchange, cost of capital
JEL: G32, G41

Introduction

The concept of disclosure holds its importance from the very definition of accounting. The American Institute of Certified Public Accountants (AICPA) defines accounting as an art of recording, classifying, and summarizing in a significant manner and in terms of money, transactions, and events which are, in part at least, of financial character, and interpreting the results thereof. The concept is broad enough to cover the area of financial reporting. Kohler (1957) defined the concept of disclosure as "a clear showing of a fact or condition on a balance sheet or other financial statement, in footnotes thereto, or in the audit report". On the one hand, Parker (1992) defined disclosure as "the reporting of information (both financial and non-financial) to users of accounting reports, especially to investors". He further added that "disclosure can be made in accordance with legislation or accounting standards or can be voluntary" (Cooke (1992, p. 231) defined disclosure as consisting of "both voluntary and mandatory items of information provided in the financial statements, notes to the

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accounts, management's analysis of operations for the current and forthcoming year and any supplementary information". On the other hand, Gibbins et al. (1990, pp. 122-126) defined financial disclosure as "any deliberate release of financial information, whether numerical or qualitative, required or voluntary, or via formal or informal channels". Choi (1973, p. 123) provided a more extensive definition of disclosure as "the publication of any economic datum relating to a business enterprise, quantitative or otherwise, which facilitates the making of economic decisions". He refers economic data to include facts which reduce the uncertainty concerning the outcomes of future economic events. He further pointed out that any improvement in disclosure can be thought of as the manifestation of an increase in both the quantity and quality of economic data disclosed by the enterprise to the investor (as users) via its published financial reports. As the definition above suggests, corporate disclosure is a wide ranging term which goes beyond the annual report. As such, there is a need to narrow down the definition of "disclosure" for the purpose of this research. The focus of this research is on those items of information provided in the corporate annual reports of Malaysian companies. As such, disclosure is defined here as the publication of any types of information through the corporate annual reports that are necessary, relevant, and material to the various user groups in making their judgments and decisions about a company. These corporate annual reports are issued annually (albeit of different year ending), especially to the shareholders and other interested parties who would like to know the activities of a company over the past year.

At present, there is no theory of corporate financial disclosure available in the accounting literature. This is due to the abstract concept of the "disclosure" itself which may mean several things to several people. Therefore, it is not surprising to find that some researchers view the concept from different perspectives. For example, Buzby (1974a; 1975b) and Wallace (1987) used the term "adequate disclosure", Singhvi and Desai (1971), Moore and Buzby (1972), and Forker (1992) used the term "disclosure quality". It is also too broad because one set of operational definitions may produce different results with those produced in another set. The characteristics of "good disclosure" and "adequate disclosure" or "quality of disclosure" may also change with time and place. Moonitz (1961) in Accounting Research Study No. 1 stated that "the concept of disclosure should be conceived of in the broadest possible terms". It can be discussed in terms of: (a) what should be disclosed: (b) to whom: and (c) how disclosure should be made.

Corporate disclosure refers to a firm's communication of both financial and non-financial information to its stakeholders and the business environment, i.e., from the private domain to the public domain (ibid, 2011).

Voluntary disclosures are defined as disclosures which are not mandated (Cooke, 1992). Voluntary disclosures in annual reports depict free choices for firm management to provide information about their financials, non-financials, and strategic operations to satisfy various stakeholders regarding their association with the organization. Annual reports are less rigid in format and provide a liberty of presentation of facts and figures beyond mandatory limits. It provides adequate information to reader regarding its reporting philosophy (Stang, 1970). There are various reasons why firms resort to voluntary disclosures. Healy and Palepu (2001, pp. 407-409) discussed the role of voluntary disclosure in capital markets. They talk about the Lemons problems (information breakdown) and agency problem where voluntary disclosures play a major role. The deliberate supply of information is a set of conflicts between incentives and deterrent forces (Graham et al., 2005). Voluntary disclosure information is a trade-off between these forces. Information conflict arises due to information differences between conveyers and users. The demand for information by the intermediaries like financial analysts and agents, who produce private information, also uncovers superior information of top

management.

Regulatory Framework of Governing Corporate Disclosures in India

1. Almost every firm in India takes a legal form as a limited liability company. Financial reporting of limited liability companies is mainly regulated by Companies Act 2013 (The Companies Act 1956). The provisions of Act relating to Accounting and Audit are built around the concept of "True and Fair" disclosure which characterizes the reporting in the UK, among other countries. The act provides the financial statements in its schedules and also lays down the penalty to be imposed both on the company and its managers responsible, for the non-compliance with the provisions of the Act.

2. Corporate disclosures for the listed limited liability companies are also governed by the listing agreement with the stock exchange provided by the regulatory body Securities and Exchange Board of India.

(1) Clause 32 of the listing agreement with any stock exchange in India: It requires a listed company to publish cash flow statements.

(2) Clause 41 of the listing agreement with any stock exchange in India: A listed company is required to publish unaudited half yearly results.

(3) Clause 43 of the listing agreement with the stock exchange: Companies are required to publish a comparison of projected gross profit, net profit, and earnings per share as shown in the offer document in a public offer of shares with the actual performance, in the report of the directors in the Annual Report.

3. The third element of the regulatory framework that governs disclosures in India is the standards and guidance notes issued by Accounting Standard Board (ASB) of the Institute of Chartered Accountants of India (ICAI). Currently, there are 32 accounting standards which have been issued by ASB out of which 29 are mandatory and three are recommendatory. The non-compliance of the requirements of these standards will attract a qualification in the auditor's report. In addition to the standards, ICAI also issues guidance notes and statements. Guidance notes are persuasive in character. They are issued as a precursor to an accounting standard.

Literature Review

The available literature in the field of voluntary disclosures is read critically and creatively in order to bring out the understanding in the domain of disclosure impact on value of Pharmaceutical Companies in India. Following is how the structure under which the review of literature is placed for the study:

1. Earliest studies on practices of corporate voluntary disclosure practices across globe including the incentives and determinants of voluntary disclosures;

2. Evidences of studies on association of voluntary disclosure with the variables under study, i.e., weighted average cost of capital, share price volatility, and market-to-book value ratio;

3. Literature on application of disclosure practices in India in the sector of pharmaceutical companies;

4. Literature identifying the research gap laying the purpose of this study.

Earliest Studies on Practices of Corporate Voluntary Disclosure

The earliest studies on voluntary disclosure center on finding out the contents required to be disclosed voluntarily, reasons to disclose them, and studying the factors influence the extent of disclosure. Published annual report is a mandatory requirement of corporate but management realizes economic gains from disclosing voluntarily. Company management recognizes that there are economic benefits to be gained from

well-managed disclosure policy (Williams, 2001). The publication of Freeman (1984)—the idea of "organisations have stakeholders" has become more provoking. The concept laid by Freeman suggested companies to take on the activities expected by identifiable group of people who can affect or are affected by the activities of the organization. The approach of Freeman is further highlighted by Clarkson (1995) that the organization should not only take up the activities affecting stakeholders but also report those activities to stakeholders. Therefore, organizations choose to disclose voluntarily about their efforts towards different stakeholders above and beyond the mandatory limits. Deegan (2000) suggested that there is a social contract between a company and the society which requires the company to be responsive to the environment, in which it operates. Lot many studies and legal frameworks have contributed towards the need of voluntary disclosure. The rising inadequacy and dissatisfaction with mandatory disclosures have demanded that companies should provide comprehensive disclosure about the long-term strategies and performance. Also, nowadays, the agenda of the corporate is to regain the lost trust of stakeholders due to world scandals of Enron, Worldcom, etc. Full disclosure plays crucial role in avoiding corporate reporting fraud (Beasley, 1996). Guan et al. (2007) found that in order to protect stakeholders and enhance transparency and the regulatory authorizes of countries have exerted a great pressure on detailed disclosures thus reducing the occurrence of agency problem arising out of information asymmetry.

This presupposition of restoring stakeholders' faith by transparent disclosure leads to signaling theory. Firms with good performance tend to make detailed disclosure more readily as it may distinguish them from marketplace. Chow and Wong Boren (1987) provided support to the argument that voluntary disclosure can positively affect quality of performance. Cooke (1989) established relationship between liquidity and disclosures proposing that firms with better liquidity are better performers and thus are more prone to disclose voluntarily. But the findings of Wallace et al. (1994) developed a contrary approach to that of Cooke. Wallace et al. (1994) claimed that weak firms are more prone to amplify the disclosures as they have to justify the liquidity status. The empirical findings of Wallace et al. (1994) developed in Spanish companies are opposite to those of Alsaeed (2006) who tested the same relationship in Saudi Arab and Barako et al. (2006) in Kenya.

The review of the earliest studies that measured the general level of voluntary disclosure in the annual reports of companies is essential to get the basis of present study. Also, it gives a theoretical background to the current study. It also paves the way for the methods adopted for this study. There are various variables affecting voluntary disclosure and then various ways by which those factors are affected by voluntary disclosures. A large number of studies establishing relationship between the voluntary disclosures and other variables have been carried out drawing mixed conclusions. All such studies reinforce the direction of each new researcher exploring different aspects of one concept. Likewise, the association of corporate voluntary disclosure with each new variable (may be cost of capital, stock price, profitability, liquidity, solvency, operating revenue, etc.) carves out a new version of voluntary disclosure affecting the values of the firms. Thus, the association between the corporate voluntary disclosures and the value of pharmaceutical companies (as measured by WACC, stock price volatility, and market-to-book value ratio) derives its base from the findings of various other studies who have tried to study these associations individually or collectively with other variables.

One of the pioneers in this field were the findings of Sanghavi and Desai (1971) who empirically examined the relationship between the voluntary information disclosure by US Companies and six other characteristics of firms (size of the assets, number of stakeholders, rate of return, ratio of net profit to net sales, size of the firm, and its listing status on national/ international stock exchange). The study was carried on 155

firms out of which 100 were listed and 55 were unlisted. A self-constructed disclosure index was used and 34 items were put on disclosure index scale. The analysis done using multivariate regression analysis found that there is a positive relationship between six independent variables and the extent of voluntary disclosure in annual reports.

Another elaborative and innovative research in this field in the early years was by Buzby (1975) tested the relationship between the disclosure extent and two firm characteristics (size of the company as measured by asset size and listing status) on a disclosure index of 39 items from 44 manufacturing companies of US. The innovation in the study was the development of disclosure index. It was developed by dividing the items of annual reports in three major groups:

Group 1: Self-contained items;

Group 2: Items disclosed on varying degree of specificity;

Group 3: Items deriving their value from sub elements of information.

First two groups had their own score depending upon the extent of information. The collective scores of first two groups were used to form score for the third, a relative measure of disclosure expressed as a percentage of the extent of actual disclosure to the extent of disclosure that could be done. Important to mention that relative disclosure was a dependent variable in the study.

The results of the study showed that the extent of disclosures is positively affected by the company size. Larger the company is, the better the extent of information disclosure in the company annual reports is. Whereas the relationship between the information disclosure and listing status was found to be Nil, i.e., no association could be witnessed between the two.

Another association of voluntary disclosure is evidenced with capital market. Choi (1973) studied the relationship between financial disclosure level and firm's decision to enter Capital Market of Europe. He took a sample of 18 companies for a period of 5 years. The time period was divided between before and after the issue of entering European capita market. The results of the study concluded that firms raising funds from European capita market significantly improved their quality of disclosure.

Literature on Association of Voluntary Disclosures with Variables Under Study

The last section (Earliest Studies on Practices of Corporate Voluntary Disclosure) showed how voluntary disclosures are linked with number of factors within an organization. The authors have studied that the voluntary disclosure affects and is affected by factors like age of the organization, size of the company, price of share, investors' sentiments, cost of capital, market price of shares, and many more. For the purpose of this study, the following section will explain the relationship between voluntary disclosures with the other dependent variables that together make "value" of the firm under this study. The researcher has taken three parameters to arrive at value of the firm.

Stock price synchronicity and voluntary disclosures. Synchronicity, though a term from psychology since 1920s, is used in finance to reflect the movement of stock price. It shows the return variation for each firm to the total return variation of the whole capital market (Roll, 1988). Generally, the concept of synchronicity explains that simultaneous occurrences happen within two or more events and the moving trends of the occurrences are observed in a meaningful manner. The Capital Asset Pricing Model (CAPM) given by William Sharpe in 1964 was the first model to discuss the firm's asset return variation relative to market return which he denoted as Beta (β). The model of William Sharpe was further extended by Black in 1976. These

models are a fundamental contribution on explaining and understanding the causality between asset prices and investment behavior.

The stock price volatility is closely associated with acquisition of information. The earliest study of King (1966) provided evidence that movement of share price is significantly dependent upon the information of the company in market and industry and it can be decreased by higher disclosures of firm-specific information.

Another mammoth contribution in this field is given by Roll (1988) who proposed that significant part of stock return variation is generated by the firm specific information. He has attempted to exemplify the impact on stock price movement when the information about firm is not available.

Guthrie and Parker (1989) studied the relationship between voluntary disclosure and stock price volatility following the theory of information asymmetry. However, the hypothesis of significant relation between voluntary disclosure and stock price volatility was surprisingly rejected depicting that voluntary disclosure has little or no effect on sentiments of the investors for buying or selling the securities

The study of Diamond and Verrechhia (1991) contradicted the study of Macquary et al.. Their study compared companies with more disclosures in their financial reports with those of companies with less disclosure and carried out a comparative study to know the impact of voluntary disclosure on information asymmetry. The study found that increasing public information in financial reports is likely to reduce information asymmetry. High disclosure also increases the liquidity of the firm's stock.

However, the study of Lang and Lundholm (1993) is a landmark study contrasting almost all the studies depicting negative association between stock price volatility and voluntary disclosure. The author calculated disclosure score assigned by Association for Investment Management and Research (AIMR), an association of financial analysis in US. The authors found more positive association between disclosures and volatility. As too much disclosure gives a perception to investor to decide about his/her near future investment return, which may be positive or negative.

The similar study was carried out in banking companies whose disclosure requirements are different from those of other corporate requirement. Bauman and Nier (2004) investigated the cross sectional association between Banks' long run volatility and long run disclosure provided by banks in their annual reports. The authors found that banks with high extent of voluntary information showed less fluctuation in stock prices than those with less extent of information disclosure.

Cost of capital and voluntary disclosures. This section of study will discuss the association between voluntary disclosures and the second component of value of firm, i.e., cost of capital. Organizations that disclose more have the benefits of reduced cost of capital enhanced investor confidence and improved marketability of their shares. There may be many incentives of disclosure, like agency cost, propriety cost, or risk mitigation concerns, but the prior studies show that cost of capital has a dominant impact on firms as an incentive of disclosure. The firms that disclose more have lesser cost of capital than firms that have low extent of disclosures. There is no doubt that the opposite of this may prevail as well.

The studies of Choi (1973) and FASB (2001) that voluntary disclosure helps to raise capital at low cost and there is a competition in the market for capital which leads to more honest disclosures.

Zhang (2001) showed that the association between voluntary disclosures and cost of capital may be positive or negative. This association is driven by what causes variation in disclosures. He found positive relation between disclosure and cost of capital when variation in disclosure is caused by cost of obtaining information or variation in liquidity or variation in earnings. On the other hand, the relationship between the

two is found to be negative only when the disclosures are driven by the cost the company has to pay to make full disclosures.

Bertomeu et al. (2011) developed a model that jointly determines a firm's capital structure, its disclosure policy, and cost of capital. The model presented a negative relationship firms' cost of capital and the extent of information disclosed. However, they further proposed that more expansive voluntary disclosure does not cause firms' cost of capital to decline.

Petrova et al. (2012) applied residual income valuation model to a sample of 121 non-financial Swiss listed firms. His model shows that firms can reduce their cost of equity capital by increasing the extent of disclosures. The result even holds true while keeping size of the firm and financial leverage, and reporting strategy as control variable.

Price to book value ratio and voluntary disclosure. Price to book (PB) value ratio has been receiving a wide attention in literature since recent years. Wilcox (1984) was among the pioneers to mention about the application of the ratio as superior to price earnings ratio. Fama (1995) demonstrated that PB ratio better explains the differences in returns than Beta. As claimed by Damodaran (1996), the relationship between price and book value attracts the attention of investors.

Walsh (1996) asserted that price to book value ratio gives the most thorough assessment of stock returns for a company. When investors plan to invest their money, they will look for stocks with superior performance. In order to judge the performance, ratios like price earning, price to book value, or dividend yield ratio can be a judgment facilitator. Out of these ratios, Panday (2000) said that price to book value ratio is widely used method of determining the value of common stocks.

When a company is set up, its value is equivalent to investment made by the owners. Along with the passage of time when its operations show pace, its market value begins to shape up. This market value is the present value of future dividends. Thus, change in value of the firms may be considered as change in ratio between book value and market price of its shares. At unity, the price to book value ratio indicates that market value and book value are identical whereas ratio greater than unity means company has added value and opposite is true for less than unity.

Most of the studies using price to book value ratio have been carried out in developed markets and their applicability in developing markets, like Indian Stock Exchange have not been empirically tested.

Literature on Study of Disclosure Trends in Indian Pharmaceutical Companies

In Indian context, SEBI has laid down statutory provisions for listed companies to ensure compliance of transparent disclosure practices. Irrespective of sector, each company has to comply with those provisions. The disclosure framework in Pharmaceutical Sector has taken a shape after year 2011 (Mehta & Chandani, 2015). The study of Mehta and Chandani (2015) takes top five Pharma companies listed on BSE for the year 2009-2010 to 2014-2015 and establishes relation between their CSR disclosures and financial performance. They assert that disclosure of CSR and its importance on company's strategy has significantly improved 2011 onwards.

Sachdeva, Batra, and Walia (2015) investigated growth in corporate disclosure practices in selected Indian companies listed on BSE during the year 2005-2012 from Pharmaceutical, FMCG, Automobile, Financial, Telecom, and IT Sector. The study shows that among all sectors, pharmaceutical sector shows the least (7%) growth in disclosure scores over the seven years as compared to FMCG sector where average increase is 26%

since 2005.

Halder and Mishra (2017) studied the factors affecting timeliness of information in Indian Pharmaceutical sector on a sample of top 50 pharma companies listed on BSE. The authors studied the lag in number of days that companies take to disclose during the year 2010-2011 to 2012-2013. They found that there is an average maximum lag of 211 days in reporting information in annual reports. They asserted that age of the company, foreign shareholding, and revenue from abroad have significant impact on timeliness of disclosure.

The other investigation on disclosure of corporate governance practices by Kalashree and Rajshekhar (2018) on 53 listed Indian Pharmaceutical companies (mid cap and large cap) for the year 2013-2014 found that among the 10 disclosure segments that authors divided for disclosure score, the listed companies are liberal towards disclosing information about remuneration, and compliance and management aspects but disclose least about subsidiary companies.

Literature Justifying the Study and Research Gap

The review of the available literature shows that most of the studies in the Indian pharmaceutical sector are related to identifying the extent of disclosure of corporate governance practices, CSR, financial components, or linking these aspects to value of firms. Though there is no dearth of number of studies conducted on voluntary disclosures and their impact on cost of capital or value of firm, yet the author finds that the Indian pharmaceutical sector has remained ignored from this perspective. The growing importance of Indian Pharmaceutical Sector as an avenue of investment and research, the author aims to undertake this study on Indian pharmaceutical companies.

As awareness level of investors is rising, their expectations from the companies are also rising, demanding honest and full disclosures. They particularly demand information to assess the timing and certainty of their present and future cash flows. Also, the investor protection guidelines laid by the watchdogs of securities of the country have made stringent regulations to assure the safety of investment. There have been transformations in the face of corporate world regarding disclosures after the implementation of guidelines of SEBI, ICAI, and Companies Act 2013. Thus, it becomes the necessity of the hour to explore the changes and study about the new scenario that may affect the growing sectors which will shape the face of Indian economy in coming times.

In India, authors like Mehta and Chandani (2015), Sachdeva et al. (2015), or Kalashree et al. (2018) had contributed their work towards Indian pharmaceutical sector; yet their contributions are limited to studying the extent of disclosures or linking the corporate governance or social practices to the financial performance of the firms. Their studies have given a mammoth contribution to form a base for climbing the next step of research in this direction. Extending their studies to a different direction, this study aims not only at assessing the extent of disclosers in Indian pharma companies but also studying the impact of those disclosures on the value of the firms. This study is unique in the sense that factors that have been combined at one place to calculate what we call as “value of firm”. Though there are innumerable factors that can equalize to value of firms, considering weighted average cost of capital, volatility of shares and market-to-book value ratio takes into consideration both the market value and book value. The similar parameters adding up to value of firm have been found in the research of Ta Quang Binh (2014) who has studied the impact of voluntary information disclosure on fluctuation of stock market on 199 listed firms in Vietnam only for the year 2009. The limitation of such similar studies in other countries, by restricting the period of study to one or two years, has paved the way to add another uniqueness to this study, i.e., making it a time series study of eight years from 2010-2011 to 2017-2018.

Significant to mention that during this span of eight years, there has been tremendous shift in disclosure practices due to amendments in Companies Act in 2013. Thus, the variation in disclosure practices will be clearly visible, and thus, analyzing their impact on value of firm will surely enlighten the policy makers of the corporate world.

Objectives of the Study

The researcher, after identifying the gap prevailing in the area of voluntary corporate disclosures, has laid down the following objectives:

1. To ascertain the extent of voluntary information disclosures in Indian pharmaceutical companies listed on Bombay Stock Exchange (BSE);

2. To study the impact of voluntary disclosures on the value of the company by establishing the relationship between:

i. Voluntary disclosure and weighted average cost of capital (WACC);

ii. Voluntary disclosure and share price volatility;

iii. Voluntary disclosure and market-to-book ratio value.

Hypothesis Development

Based on the results of the previous studies and the conceptual design, the following tentative research hypotheses have been developed to answer the evolved research questions:

H_{01}: There is no significant relationship between voluntary disclosure and cost of capital

H_{02}: There is no significant relationship between voluntary disclosure and share price volatility

H_{03}: There is no significant relationship between voluntary disclosure with market-to-book value ratio.

Research Methodology

Sample unit: Companies listed on Bombay Stock Exchange (BSE)

Sample size: Companies listed companies from BSE (large cap having capital of more than Rs. 10,000 crores)

Sector under study: Pharmaceutical sector

Period under study: eight years from 2010-2011 to 2017-2018

Statistical software: E-Views

Statistical tool: Univariate and multivariate analysis

Basis for selection of companies under study:

- The company is listed on the Bombay Stock Exchange for more than three years.
- The basis for selection is their market capitalization
- The company's ticker symbol does not suffer a halt for more than three months on stock market.
- The company's voluntary data should coincide at least 50% of the check list set in by the researcher for the purpose of study.
- The data about the company should be available.

Measurement of Variables

Measurement of corporate voluntary disclosure (VDCL). Prior to year 1985, many studies had

calculated disclosure quality but the concrete explanation about calculating the extent of voluntary disclosure was formulated by Firer and Meth (1986); Wallace (1988); and Meek, Roberts, and Gray (1995). Wallace et al. (1994) described disclosure as an abstract construct that does not possess its own inherent characteristics. They developed a checklist method to score the voluntary disclosure items on a dichotomous scale of assigning 1 if disclosure is there and 0 is no disclosure found and thus calculating the total score. Chau and Gray (2002) had also used this checklist with some minor changes to calculate the voluntary disclosure of Hong Kong firms.

Following the same checklist method, the corporate voluntary disclosure as denoted by VDCL is arrived at, by splitting total 55 items into six categories of different items of same nature placed under one category. These 55 items are extracted from a list of 71 variables, eliminating the mandatory ones. The sub categories are:

VDCL 1 = General corporate information;

VDCL 2 = External audit committee;

VDCL 3 = Financial information;

VDCL 4 = Forward looking information;

VDCL 5 = Employee information, social responsibility and environmental policy;

VDCL 6 = Board structure disclosure.

Measurement of weighted average cost of capital (WACC). Weighted average cost of capital is the average return expected by the capital owners. The capital structure of the company may consist of equity shares, preference shares, loans and mortgages, deposits, or debentures. Each security bears some cost of issue and the holders expect return on the security equal or over to premium of govt. securities.

WACC is calculated by multiplying the cost of each capital component by its proportional weight and then summing:

$$\text{WACC} = W_e \times K_e + W_d \times K_d$$

Where, W_e = Weight of equity; W_d = Weight of debt; K_e = Cost of equity (calculated applying CAPM); and K_d = Cost of debt.

Share price volatility. The market price of any security may change over a period of time. Volatility is a measure of speed and extent of stock price changes. It is the relative movement of a stock to the movement of index. Volatility can be measured using variance or standard deviation. A high value of standard deviation depicts higher volatility and vice versa. For the purpose of calculation of stock price volatility in this study, standard deviation daily log returns of the stock prices are calculated. The resulting figure is then divided by the square root of number of trading days for that particular security.

The formula arrived is as follows:

$$\frac{V_i = \sum \sigma_i^t}{D_i}$$

Where V_i = Share price volatility of firm i; D_i = Number of trading days for the share of company i; σ_i^t = Daily standard deviation of price of share i.

The output of the above formula is annual share price volatility as measured by the average daily standard deviation of share price.

Analysis and Interpretations

In the present study, in order to understand the voluntary corporate disclosure practices followed by the pharmaceuticals companies selected for the purpose of study a voluntary disclosure index has been designed

based on which the calculation is done. The index designed for understanding the voluntary disclosure index considers the 55 statements related to the voluntary disclosure broadly classified into six dimensions. The response about the particular statement was considered to be binomial in nature having a zero score for a non-response item while one was assigned to a positive response item. The results of companies on a disclosure index are shown as follows:

Table 1

Company Wise Voluntary Disclosure Scores

Company/Year	2018	2017	2016	2015	2014	2013	2012	2011	Average score	Average (%)
CADILA	25	25	18	18	19	17	17	22	20.13	36.59
BIOCON	26	27	28	27	24	25	22	22	25.13	45.68
CIPLA	28	27	28	24	13	13	13	13	19.88	36.14
PIRAMAL	37	31	30	25	20	17	18	17	24.38	44.32
DREDDY	26	28	26	23	24	26	12	12	22.13	40.23
LUPIN	27	24	24	25	24	24	22	21	23.88	43.41
TORRENT	15	14	14	10	8	7	7	7	10.25	18.64
PFIZER	32	30	28	26	12	16	10	14	21.00	38.18
GLAXO	15	16	15	17	15	16	15	15	15.50	28.18
DIVIS LAB	17	20	20	13	15	18	18	16	17.13	31.14
AURO	32	28	30	29	28	28	25	26	28.25	51.36
AJANTA	16	17	17	17	18	15	14	15	16.13	29.32
SUNPHARMA	22	22	21	20	18	16	14	15	18.50	33.64

Table 1 shows that the voluntary disclosure scores obtained by the companies from the year 2010-2011 to 2017-2018 are calculated for the companies selected for the purpose of the study. The range of voluntary disclosure score ranges from 10.25 to 28.25 (in absolute terms) with the score range ranging from 18.64% to 51.36%. Most of the companies could not score high in the voluntary disclosure scores. It shows the need for adopting disclosure friendly practices by the companies in India to compete with the global disclosure standards.

Table 2

Descriptive Statistics for Disclosure Score

	2018	2017	2016	2015	2014	2013	2012	2011
Mean	24.46	23.77	23.00	21.08	18.31	18.31	15.92	16.54
Standard error	1.97	1.54	1.61	1.60	1.58	1.63	1.42	1.40
Median	26.00	25.00	24.00	23.00	18.00	17.00	15.00	15.00
Mode	26.00	27.00	28.00	25.00	24.00	16.00	22.00	15.00
Standard deviation	7.11	5.54	5.79	5.75	5.71	5.89	5.11	5.06
Sample variance	50.60	30.69	33.50	33.08	32.56	34.73	26.08	25.60
Kurtosis	-0.93	-0.98	-1.54	-0.62	-0.56	-0.19	-0.39	0.09
Skewness	0.05	-0.54	-0.27	-0.56	-0.05	0.09	0.15	0.17

Table 2 shows the mean score of the companies for voluntary disclosure ranges from 16.54 to 24.46 starting from the year 2011 to 2018. The mean voluntary disclosure score exhibits a steady increasing trend over the years; however, during the year 2012, the mean score marginally dipped to 15.92 from 16.54 during the year 2011. The year 2013 and 2014 showed the same mean score of 18.31 for the voluntary disclosure score. The year 2015 to 2018 showed an increasing trend starting from 21.08 (2015) to 24.46 (2018). The median of the voluntary

disclosure score exhibits a steady increasing trend over the years starting from 15.00 (2011) to 26.00 (2018). The modal value of the voluntary disclosure score exhibits increasing trend over the years starting from 15.00 (2011) to 26.00 (2018), with fluctuations during the intermediate years with the score being 22.00(2012) and 28.00(2016), thereby exhibiting fluctuations in the intermediate years. The sample variance of the voluntary disclosure score exhibits a steady increasing trend over the years starting from 25.60 (2011) to 50.60 (2018), thereby exhibiting higher variability in the companies reporting the voluntary disclosure scores. The sample skewness and kurtosis of the voluntary disclosure score exhibits normality of the data set over the years.

Univariate Analysis

The four variables selected for the purpose of study are represented by VDSCORE, VOLATILITY, PBRATIO, and WACC representing voluntary disclosure score index of the companies, volatility index of the companies, weighted average cost of capital, and PB ratio of the companies selected for the study. The variables when subjected to normality testing for all the variables the hypothesis were rejected confirming the fact that the variables were not drawn from a normal population. Hence, parametric test for correlation analysis was not applicable in this case. Non-parametric correlation test known as spearman correlation was conducted to understand the extent of relationship pattern between the variables so as to induce the other regression analysis.

Table 3

Spearman Rank Correlation Matrix

	PBRATIO	VDSCORE	VOLATILITY	WACC
PBRATIO	1.000000	-0.200960	-0.227427	-0.077303
VDSCORE	-0.200960	1.000000	0.087820	0.024858
VOLATILITY	-0.227427	0.087820	1.000000	0.320909
WACC	-0.077303	0.024858	0.320909	1.000000

The test results in Table 3 reveal that there is not much higher degree of correlation between the dependent variable when is VDSCORE and independent variables (VOLATILITY, PBRATIO, and WACC). The dependent variable VDSCORE exhibited a negative correlation of -0.2 with PBRATIO and positive correlation with VOLATILITY and WACC with values of 0.08 and 0.02 respectively. The independent variables were also tested for correlation amongst them and the study reveals that VOLATILITY was negatively related with PBRATIO with the score of -0.22; WACC was negatively related with PBRATIO with score of -0.07. The correlation between the variables is not a matter of concern and the data can be further subjected to regression analysis. However, before going for multiple regression analysis, the data were subjected to other test of correlation in order to be sure of no collinearity problem between the explanatory variables (VOLATILITY, PBRATIO, and WACC). Each of the explanatory variables were considered as dependent variable and regressed with that of the other two explanatory variables considered to be independent in each case. In the first model, WACC was considered as the dependent variable, and VOLATILITY and PBRATIO were considered as the independent variables. In the second model, VOLATILITY was considered as the dependent variable, and PBRATIO and WACC were considered as the independent variables. In the third model, PBRATIO was considered as the dependent variable, and WACC and VOLATILITY were considered as independent variables. The three models were tested for understanding the co-linearity problem between the explanatory variables (VOLATILITY, PBRATIO, and WACC). Variance inflation factor (VIF) was studied for the purpose of

understanding collinearity problem. VIF of greater than 3 indicates presence of collinearity; a value greater than 5 indicates that collinearity problem definitely exist; and value greater than 10 indicates a serious collinearity problem.

Model 1: VIF value WACC regressed with that of VOLATILITY and PBRATIO.

Table 4

Model 1: VIF Value WACC Regressed With That of VOLATILITY and PBRATIO

Model		Unstandardized coefficients		Standardized coefficients	*t*	*Sig.*	Collinearity statistics	
		B	Std. error	Beta			Tolerance	VIF
	(Constant)	9.272	0.228		40.701	0.000		
1	VOLATILITY	0.001	0.006	0.012	0.117	0.907	0.977	1.024
	PBRATIO	-0.044	0.036	-0.122	-1.217	0.226	0.977	1.024

Note. Dependent variable: WACC.

Outcome of the regression model in Model 1 reveals that the VIF value of volatility and PB ratio is 1.0 24 indicating no collinearity problem between VOLATILITY, PBRATI, and WACC.

Model 2: VIF value VOLATILITY regressed with that of WACC and PBRATIO. Model 2 shows that when VOLATILITY was regressed with WACC and PBRATIO, the variance inflation factor (VIF) of WACC and PBRATIO was 1.015 indicating presence of no collinearity between VOLATILITY, WACC, and PBRATIO.

Model 3: VIF value PBRATIO regressed with that of WACC and VOLATILITY. Model 3 of regression analysis reveals that the value of WACC and VOLATILITY when regressed with PBRATIO is of 1.001 indicating presence of no collinearity problem between PBRATIO, WACC, and VOLATILITY.

Table 5

Model 3: VIF Value PBRATIO Regressed With That of WACC and VOLATILITY

Model		Unstandardized coefficients		Standardized coefficients	*t*	*Sig.*	Collinearity statistics	
		B	Std. error	Beta			Tolerance	VIF
	(Constant)	8.485	2.486		3.413	0.001		
1	WACC	-0.332	0.273	-0.119	-1.217	0.226	0.999	1.001
	VOLATILITY	-0.025	0.016	-0.149	-1.526	0.130	0.999	1.001

Note. Dependent variable: PBRATIO.

Multivariate Analysis

Based on the universe analysis, it is confirmed that collinearity is not a problem for subsequent analysis of the data set. In order to continue with the multivariate analysis and to test the three hypothesis of the study panel data regression was conducted.

In the first stage, Fixed Effect Model of panel regression using least square technique of estimation was conducted to understand the effect of VDSCORE on VOLATILITY, PBRATIO, and WACC respectively.

In the second stage, Random Effect Model of panel regression using Panel EGLS (cross-section random effects) estimation was conducted to understand the effect of VDSCORE on VOLATILITY, PBRATIO, and WACC respectively across time period.

In the third stage, Hausman test was conducted to identify the applicability of the Fixed Effect and the Random Effect Model in the data set.

Lastly Random Effect Model of panel regression with Swamy Arora estimator of component variances using white cross section standard errors and covariance (with *df* corrected) using the least square technique of estimation was conducted to understand the effect of VDSCORE on VOLATILITY, PBRATIO, and WACC respectively.

Model 4: Fixed Effect Panel Regression Model (impact of VDSCORE on PBRATIO).

Table 6

Model 4: Fixed Effect Panel Regression Model (Impact of VDSCORE on PBRATIO)

Dependent variable: PBRATIO				
Method: Panel Least Squares				
Date: 09/24/18; Time: 19:35				
Sample: 2010 2018				
Periods included: 9				
Cross-sections included: 12				
Total panel (unbalanced) observations: 104				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	6.173239	1.086288	5.682874	0.0000
VDSCORE	-0.040213	0.052239	-0.769790	0.4434
	Effects specification			
Cross-section fixed (dummy variables)				
R-Squared	0.376085	Mean dependent var.		5.362019
Adjusted R-Squared	0.293810	SD dependent var.		3.198920
SE of regression	2.688216	Akaike info criterion		4.932101
Sum squared resid	657.6120	Schwarz criterion		5.262650
Log likelihood	-243.4693	Hannan-Quinn criter.		5.066016
F-statistic	4.571095	Durbin-Watson stat.		0.791185
Prob(F-statistic)	0.000010			

The fixed effect model of panel regression using least square technique of estimation was conducted to understand the effect of VDSCORE on PBRATIO. The results indicate that VDSCORE (p value of 0.44) on an average at an individual level does not significantly influence the PBRATIO of the pharmaceutical companies.

Model 5: Fixed Effect Panel Regression Model (impact of VDSCORE on VOLATILITY).

Table 7

Model 5: Fixed Effect Panel Regression Model (Impact of VDSCORE on VOLATILITY)

Dependent variable: VOLATILITY				
Method: Panel Least Squares				
Date: 09/24/18; Time: 19:39				
Sample: 2010 2018				
Periods included: 9				
Cross-sections included: 12				
Total panel (unbalanced) observations: 104				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	6.697005	7.029740	0.952668	0.3433
VDSCORE	-0.091512	0.338056	-0.270700	0.7872
	Effects specification			
Cross-section fixed (dummy variables)				
R-Squared	0.289050	Mean dependent var.		4.850932
Adjusted R-Squared	0.195299	SD dependent var.		19.39283
SE of regression	17.39636	Akaike info criterion		8.666868
Sum squared resid	27539.63	Schwarz criterion		8.997417
Log likelihood	-437.6771	Hannan-Quinn criter.		8.800783
F-statistic	3.083153	Durbin-Watson stat.		1.256281
Prob(F-statistic)	0.001085			

The fixed effect model of panel regression using least square technique of estimation was conducted to understand the effect of VDSCORE on VOLATILITY. The result indicates that VDSCORE (*p*-value of 0.78) on an average at an individual level does not significantly influence the VOLATILITY of the pharmaceutical companies.

Model 6: Fixed Effect Panel Regression Model (impact of VDSCORE on WACC).

Table 8

Model 6: Fixed Effect Panel Regression Model (Impact of VDSCORE on WACC)

Dependent variable: WACC				
Method: Panel Least Squares				
Date: 09/24/18; Time: 19:40				
Sample: 2010 2018				
Periods included: 9				
Cross-sections included: 12				
Total panel (unbalanced) observations: 104				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	9.371127	0.398427	23.52032	0.0000
VDSCORE	-0.016314	0.019160	-0.851468	0.3967
	Effects specification			
Cross-section fixed (dummy variables)				
R-Squared	0.344594	Mean dependent var.		9.042019
Adjusted R-Squared	0.258167	SD dependent var.		1.144760
SE of regression	0.985979	Akaike info criterion		2.926106
Sum squared resid	88.46612	Schwarz criterion		3.256655
Log likelihood	-139.1575	Hannan-Quinn criter.		3.060021
F-statistic	3.987099	Durbin-Watson stat.		1.952232
Prob(F-statistic)	0.000060			

The fixed effect model of panel regression using least square technique of estimation was conducted to understand the effect of VDSCORE on WACC. The result indicates that VDSCORE (*p*-value of 0.39) on an average at an individual level does not significantly influence the WACC of the pharmaceutical companies.

Model 7: Random Effect Panel Regression Model (impact of VDSCORE on PBRATIO).

Table 9

Model 7: Random Effect Panel Regression Model (Impact of VDSCORE on PBRATIO)

Dependent variable: PBRATIO
Method: Panel EGLS (Cross-section random effects)
Date: 09/24/18; Time: 19:41
Sample: 2010 2018
Periods included: 9
Cross-sections included: 12
Total panel (unbalanced) observations: 104
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. error	t-statistic	Prob.
C	6.580975	1.119962	5.876070	0.0000
VDSCORE	-0.060781	0.048796	-1.245611	0.2158
	Effects specification			
			SD	Rho
Cross-section random			1.673690	0.2793
Idiosyncratic random			2.688216	0.7207
	Weighted statistics			
R-Squared	0.014964	Mean dependent var.		2.560614
Adjusted R-Squared	0.005307	SD dependent var.		2.701384
SE of regression	2.689958	Sum squared resid		738.0593
F-statistic	1.549539	Durbin-Watson stat.		0.704141
Prob(F-statistic)	0.216056			
	Unweighted statistics			
R-Squared	0.037393	Mean dependent var.		5.362019
Sum squared resid	1014.596	Durbin-Watson stat.		0.512222

The Random Effect Model of panel regression using Panel EGLS (cross-section random effects) estimation was conducted to understand the effect of VDSCORE on PBRATIO across time period. The result indicates that VDSCORE (*p*-value of 0.21) does not significantly influence the PBRATIO of the pharmaceutical companies across time period.

Model 8: Random Effect Panel Regression Model (impact of VDSCORE on VOLATILITY).

Table 10

Model 8: Random Effect Panel Regression Model (Impact of VDSCORE on VOLATILITY)

Dependent variable: VOLATILITY				
Method: Panel EGLS (Cross-section random effects)				
Date: 09/24/18; Time: 19:42				
Sample: 2010 2018				
Periods included: 9				
Cross-sections included: 12				
Total panel (unbalanced) observations: 104				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	8.380696	6.954618	1.205055	0.2310
VDSCORE	-0.181349	0.310270	-0.584487	0.5602
	Effects specification			
			SD	Rho
Cross-section random			9.102326	0.2149
Idiosyncratic random			17.39636	0.7851
	Weighted statistics			
R-Squared	0.370357	Mean dependent var.		2.608458
Adjusted R-Squared	-0.006414	SD dependent var.		17.28874
SE of regression	17.34806	Sum squared resid		30697.44
F-statistic	0.343529	Durbin-Watson stat.		1.130110
Prob(F-statistic)	0.559094			
	Unweighted statistics			
R-Squared	0.010026	Mean dependent var.		4.850932
Sum squared resid	38348.04	Durbin-Watson stat.		0.904648

The Random Effect Model of panel regression using Panel EGLS (cross-section random effects) estimation was conducted to understand the effect of VDSCORE on VOLATILITY across time period. The result indicates that VDSCORE (*p*-value of 0.56) does not significantly influence the VOLATILITY of the pharmaceutical companies across time period.

Model 9: **Random Effect Panel Regression Model (impact of VDSCORE on WACC).**

Table 11

Model 9: Random Effect Panel Regression Model (Impact of VDSCORE on WACC)

Dependent variable: WACC				
Method: Panel EGLS (cross-section random effects)				
Date: 09/24/18; Time: 19:43				
Sample: 2010 2018				
Periods included: 9				
Cross-sections included: 12				
Total panel (unbalanced) observations: 104				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	9.214974	0.412714	22.32776	0.0000
VDSCORE	-0.009364	0.017929	-0.522291	0.6026
	Effects specification			
			S.D.	Rho
Cross-section random			0.625282	0.2868
Idiosyncratic random			0.985979	0.7132
	Weighted statistics			
R-Squared	0.002672	Mean dependent var.		4.252191
Adjusted R-Squared	-0.007106	SD dependent var.		0.989484
SE of regression	0.985184	Sum squared resid		98.99991
F-statistic	0.273228	Durbin-Watson stat.		1.745947
Prob(F-statistic)	0.602308			
	Unweighted statistics			
R-Squared	-0.004863	Mean dependent var.		9.042019
Sum squared resid	135.6354	Durbin-Watson stat.		1.274362

The Random Effect Model of panel regression using Panel EGLS (cross-section random effects) estimation was conducted to understand the effect of VDSCORE on WACC across time period. The result indicates that VDSCORE (*p*-value of 0.60) does not significantly influence the WACC of the pharmaceutical companies across time period.

Model 10: Hausman Test for Fixed Effect/Random Effect Panel Regression Model (impact of VDSCORE on PBRATIO).

Table 12

Model 10: Hausman Test for Fixed Effect/Random Effect Panel Regression Model (Impact of VDSCORE on PBRATIO)

Correlated Random Effects—Hausman Test				
Equation: Untitled				
Test cross-section random effects				
Test summary		Chi-Sq. statistic	Chi-Sq. df	Prob.
Cross-section random		1.216331	1	0.2701
Cross-section random effects test equation:				
Dependent variable: PBRATIO				
Method: Panel Least Squares				
Date: 09/24/18; Time: 19:51				
Sample: 2010 2018				
Periods included: 9				
Cross-sections included: 12				
Total panel (unbalanced) observations: 104				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	6.173239	1.086288	5.682874	0.0000
VDSCORE	-0.040213	0.052239	-0.769790	0.4434
	Effects specification			
Cross-section fixed (dummy variables)				
R-Squared	0.376085	Mean dependent var.		5.362019
Adjusted R-Squared	0.293810	SD dependent var.		3.198920
SE of regression	2.688216	Akaike info criterion		4.932101
Sum squared resid	657.6120	Schwarz criterion		5.262650
Log likelihood	-243.4693	Hannan-Quinn criter.		5.066016
F-statistic	4.571095	Durbin-Watson stat.		0.791185
Prob(F-statistic)	0.000010			

The result of Hausman test indicates that the null hypothesis cannot be rejected in this case and hence Random Effect Model is suited for the data set to understand the impact of VDSCORE on PBRATIO. The probability value of the Chi-square statistics being 0.27 and the chi-square statistic been 1.21 indicates that the null hypothesis of applicability of Random Effect Model cannot be rejected and hence Random Effect Model is applicable in this data set to understand the impact of VDSCORE on PBRATIO.

Model 11: Hausman Test for Fixed Effect/Random Effect Panel Regression Model (impact of VDSCORE on VOLATILITY).

Table 13

Model 11: Hausman Test for Fixed Effect/Random Effect Panel Regression Model (Impact of VDSCORE on VOLATILITY)

Correlated Random Effects—Hausman Test				
Equation: Untitled				
Test cross-section random effects				
Test summary		Chi-Sq. statistic	Chi-Sq. df	Prob.
Cross-section random		0.448022	1	0.5033
Cross-section random effects test equation:				
Dependent variable: VOLATILITY				
Method: Panel Least Squares				
Date: 09/24/18; Time: 19:53				
Sample: 2010 2018				
Periods included: 9				
Cross-sections included: 12				
Total panel (unbalanced) observations: 104				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	6.697005	7.029740	0.952668	0.3433
VDSCORE	-0.091512	0.338056	-0.270700	0.7872
	Effects specification			
Cross-section fixed (dummy variables)				
R-Squared	0.289050	Mean dependent var.		4.850932
Adjusted R-Squared	0.195299	SD dependent var.		19.39283
SE of regression	17.39636	Akaike info criterion		8.666868
Sum squared resid	27539.63	Schwarz criterion		8.997417
Log likelihood	-437.6771	Hannan-Quinn criter.		8.800783
F-statistic	3.083153	Durbin-Watson stat.		1.256281
Prob(F-statistic)	0.001085			

The result of Hausman test indicates that the null hypothesis cannot be rejected in this case and hence Random Effect Model is suited for the data set to understand the impact of VDSCORE on VOLATILITY. The probability value of the Chi-square statistics being 0.44 and the Chi-square statistic been 0.50 indicates that the null hypothesis of applicability of Random Effect Model cannot be rejected and hence Random Effect Model is applicable in this data set to understand the impact of VDSCORE on VOLATILITY.

Model 12: Hausman Test for FE/RE Panel Regression Model (impact of VDSCORE on WACC).

Table 14

Model 12: Hausman Test for FE/RE Panel Regression Model (Impact of VDSCORE on WACC)

Correlated Random Effects—Hausman Test				
Equation: Untitled				
Test cross-section random effects				
Test summary		Chi-Sq. statistic	Chi-Sq. df	Prob.
Cross-section random		1.057606	1	0.3038
Cross-section random effects test equation:				
Dependent Variable: WACC				
Method: Panel Least Squares				
Date: 09/24/18; Time: 19:54				
Sample: 2010 2018				
Periods included: 9				
Cross-sections included: 12				
Total panel (unbalanced) observations: 104				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	9.371127	0.398427	23.52032	0.0000
VDSCORE	-0.016314	0.019160	-0.851468	0.3967
	Effects specification			
Cross-section fixed (dummy variables)				
R-Squared	0.344594	Mean dependent var.		9.042019
Adjusted R-Squared	0.258167	SD dependent var.		1.144760
SE of regression	0.985979	Akaike info criterion		2.926106
Sum squared resid	88.46612	Schwarz criterion		3.256655
Log likelihood	-139.1575	Hannan-Quinn criter.		3.060021
F-statistic	3.987099	Durbin-Watson stat.		1.952232
Prob(F-statistic)	0.000060			

The result of Hausman test indicates that the null hypothesis cannot be rejected in this case and hence Random Effect Model is suited for the data set to understand the impact of VDSCORE on WACC. The probability value of the Chi-square statistics being 0.30 and the Chi-square statistic been 1.05 indicates that the null hypothesis of applicability of Random Effect Model cannot be rejected and hence Random Effect Model is applicable in this data set to understand the impact of VDSCORE on WACC.

Model 13: Random Effect Panel Regression using White cross section standard error and covariance (impact of VDSCORE on PBRATIO)

Table 15

Model 13: Random Effect Panel Regression Using White Cross Section Standard Error and Covariance (Impact of VDSCORE on PBRATIO)

Dependent variable: PBRATIO				
Method: Panel EGLS (Cross-section random effects)				
Date: 09/24/18; Time: 19:55				
Sample: 2010 2018				
Periods included: 9				
Cross-sections included: 12				
Total panel (unbalanced) observations: 104				
Swamy and Arora estimator of component variances				
White cross-section standard errors & covariance (df corrected)				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	6.580975	0.663688	9.915773	0.0000
VDSCORE	-0.060781	0.014796	-4.108010	0.0001
	Effects specification			
			SD	Rho
Cross-section random			1.673690	0.2793
Idiosyncratic random			2.688216	0.7207
	Weighted statistics			
R-Squared	0.014964	Mean dependent var.		2.560614
Adjusted R-Squared	0.005307	SD dependent var.		2.701384
SE of regression	2.689958	Sum squared resid		738.0593
F-statistic	1.549539	Durbin-Watson stat.		0.704141
Prob(F-statistic)	0.216056			
	Unweighted Statistics			
R-Squared	0.037393	Mean dependent var.		5.362019
Sum squared resid	1014.596	Durbin-Watson stat.		0.512222

When PBRATIO was regressed with the independent variables VDSCORE using random effect panel regression using Swamy and Arora estimator of component variances and white cross-section standard error and covariance the results revealed that VDSCORE significantly affects PBRATIO of the companies. The probability value of VDSCORE is 0.0001 is significant at 1% level of significance. The coefficient sign of VDSCORE is negative indicating that an increase in VDSCORE will result in decrease of PBRATIO. The coefficient value of VDSCORE is -0.06 indicating that an increase in 1 percentage in VDSCORE will decrease the PBRATIO by 0.06 percentage points.

Model 14: Random Effect Panel Regression using White cross section standard error and covariance (impact of VDSCORE on VOLATILITY).

Table 16

Model 14: Random Effect Panel Regression Using White Cross Section Standard Error and Covariance (Impact of VDSCORE on VOLATILITY)

Dependent variable: VOLATILITY				
Method: Panel EGLS (Cross-section random effects)				
Date: 09/24/18; Time: 19:56				
Sample: 2010 2018				
Periods included: 9				
Cross-sections included: 12				
Total panel (unbalanced) observations: 104				
Swamy and Arora estimator of component variances				
White cross-section standard errors & covariance (df corrected)				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	8.380696	4.081428	2.053374	0.0426
VDSCORE	-0.181349	0.103752	-1.747914	0.0835
	Effects specification			
			SD	Rho
Cross-section random			9.102326	0.2149
Idiosyncratic random			17.39636	0.7851
	Weighted statistics			
R-Squared	0.003357	Mean dependent var.		2.608458
Adjusted R-Squared	-0.006414	SD dependent var.		17.28874
SE of regression	17.34806	Sum squared resid		30697.44
F-statistic	0.343529	Durbin-Watson stat.		1.130110
Prob(F-statistic)	0.559094			
	Unweighted statistics			
R-Squared	0.010026	Mean dependent var.		4.850932
Sum squared resid	38348.04	Durbin-Watson stat.		0.904648

When VOLATILITY was regressed with the independent variable VDSCORE using Random Effect Panel Regression using Swamy and Arora estimator of component variances and White cross section standard error and covariance the results revealed that VDSCORE significantly affects VOLATILITY of the companies. The probability value of VDSCORE is 0.08 is significant at 10% level of significance. The coefficient sign of VDSCORE is negative indicating that an increase in VDSCORE will result in decrease of VOLATILITY. The coefficient value of VDSCORE is -0.18 indicating that an increase in 1 percentage in VDSCORE will decrease the VOLATILITY by 0.18 percentage points.

Model 15: Random Effect Panel Regression using White cross section standard error and covariance (impact of VDSCORE on WACC).

Table 17

Model 15: Random Effect Panel Regression Using White Cross Section Standard Error and Covariance (Impact of VDSCORE on WACC)

Dependent variable: WACC				
Method: Panel EGLS (Cross-section random effects)				
Date: 09/24/18; Time: 19:57				
Sample: 2010 2018				
Periods included: 9				
Cross-sections included: 12				
Total panel (unbalanced) observations: 104				
Swamy and Arora estimator of component variances				
White cross-section standard errors & covariance (df corrected)				
Variable	Coefficient	Std. error	t-statistic	Prob.
C	9.214974	0.501569	18.37229	0.0000
VDSCORE	-0.009364	0.023921	-0.391457	0.6963
	Effects specification			
			SD	Rho
Cross-section random			0.625282	0.2868
Idiosyncratic random			0.985979	0.7132
	Weighted statistics			
R-Squared	0.002672	Mean dependent var.		4.252191
Adjusted R-Squared	-0.007106	SD dependent var.		0.989484
SE of regression	0.985184	Sum squared resid		98.99991
F-statistic	0.273228	Durbin-Watson stat.		1.745947
Prob(F-statistic)	0.602308			
	Unweighted statistics			
R-Squared	-0.004863	Mean dependent var.		9.042019
Sum squared resid	135.6354	Durbin-Watson stat.		1.274362

When WACC was regressed with the independent variable VDSCORE using Random Effect Panel Regression using Swamy and Arora estimator of component variances and White cross section standard error and covariance the results revealed that VDSCORE does not significantly affects WACC of the companies. The probability value of WACC is 0.69 is insignificant even at 10% level of significance. The coefficient sign of VDSCORE is negative indicating that an increase in VDSCORE will result in decrease of WACC.

Conclusion

In the present study, in order to understand the voluntary corporate disclosure practices followed by the pharmaceuticals companies selected for the purpose of study, a voluntary disclosure index has been designed based on which the calculation is done. The index designed for understanding the voluntary disclosure index considers the 55 statements related to the voluntary disclosure broadly classified into six dimensions. The response about the particular statement was considered to be binomial in nature having a zero score for a non-response item while one was assigned to a positive response item. The disclosure scores when summed up, it was found that a maximum value that a company could attain any year was 37 (Piramal) out of total 55 (see Table

1). That means not even a single company discloses at least 80% of the proposed voluntary disclosure items considered under study. The companies are not disclosure friendly. Though there have been strict regulations laid by the regulators of the company especially after the enactment of Companies Act 2013 that focus on strict disclosures, still the companies show a reluctance in disclosing the information. No doubt that there seems to be a increasing trend in the extent of disclosures from 2010-2011 to 2017-2018, yet companies like Torrent Pharmaceuticals are existing with a disclosure score as low as 17 out of 55 in a year. Overall, the increasing trends in last eight years can be a good news if the trend continues in same direction. Thus, fulfilling its one objective, i.e., to know that extent of disclosure, the overall score is not so satisfactory.

To answer the second objective of knowing the impact of disclosure on the value of pharmaceutical firms, a univariate and multivariate analysis is done adopting panel data regression technique. The analysis applies spearman's rank correlation, variance inflation factor, Hausman's test, and Random Effect Panel Data Regression to arrive at the results which show that:

1. Voluntary disclosure and weighted average cost of capital (WACC) are not related;
2. Voluntary disclosure and share price volatility are negatively related;
3. Voluntary disclosure and market-to-book ratio value are negatively related.

The relationship between WACC and voluntary disclosure are nullified and show that whether a company increases or decreases disclosures, the cost of capital has no effect. The result is contrary to many earlier studies mentioned in the literature that claim that companies resort to more disclosure in order to decrease their cost of capital. This is found to be not applicable to Indian Pharmaceutical Industry.

The voluntary disclosure and share price volatility are negatively related and the result is justified by Model 10 in the study signifying the coefficient value of VDSCORE is -0.18 indicating that an increase in 1 percentage in VDSCORE will decrease the VOLATILITY by 0.18 percentage points. This happens because investors predict the near future performance of the company through the disclosures made by the company in the report. The stock movements are a result of investor's sentiments which keep on fluctuating. Hence, disclosures play a dominant role in stock price movements. The signaling theory discussed in this study is found to be correct in Indian pharmaceutical industry, too. The companies with high volatility should resort to more voluntary disclosures.

Lastly, the disclosure and PB ratio are also found to be negatively related signifying the coefficient value of VDSCORE is -0.06 indicating that an increase in 1 percentage in VDSCORE will decrease the PBRATIO by 0.06 percentage points. It shows that the value of firm falls when disclosure increase. This is a surprising result that study has brought. This provides for discouragement to companies to disclose more. It supports the argument that more disclosure may lead to transparency of internal information that may be unfavorable and spread a wave of negative sentiments among the readers. The companies are advised to restrict the extra information in the reports that may inadvertently affect the thinking process of readers.

To conclude, the present disclosure system in India fails to distinguish between the very different needs of the users of the financial reports. While some users may be happy to have lengthy disclosures that may bring a positive impact on fluctuate of stocks in the market, others may be sent information that is far longer and complex to understand to make use of. The set of information useful for most users could be sort, precise, and beyond a minimal core, it has to be decided by the company to reflect its own circumstances.

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