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A MULTI-CRITERIA FRAMEWORK FOR COMPARING DIVIDEND PAY CAPABILITIES: EVIDENCE FROM INDIAN FMCG AND CONSUMER DURABLE SECTOR

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Abstract: *In this paper, we aim to carry out a comparative analysis of the dividend pay capabilities (DPC) of the selected organizations belonging to the Fast Moving Consumer Goods (FMCG) and Consumer Durables (CD) sectors listed in BSE, India during the period FY 2013-14 to FY 2019-20. We select top 25 companies from FMCG group and top 5 firms from the CD sector on the basis of average market capitalization. For comparison purpose, we have considered six aspects (grounded on the extant theories on dividend policy) such as ownership, size, profitability, growth, liquidity and risk. We have used a new integrated Logarithmic Percentage Change-driven Objective Weighting (LOPCOW) and Evaluation based on Distance from Average Solutions (EDAS) framework for our analysis. The result shows that companies do not show consistent performance over the years. We further have noticed that FMCG organizations show comparatively better capabilities that CD firms vis-à-vis dividend payment. Since, there are considerable variations in the ranking, we apply aggregation methods like Borda Count (BC), Copeland method (CM) and Simple additive weighting (SAW). We use two other popular Multi-Criteria Decision Making (MCDM) methods like multi-attributive border approximation area comparison (MABAC) and the Complex Proportional Assessment (COPRAS) for comparison with our framework to ascertain the reliability of our result.*

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1. Introduction

Dividend is a part of the profit distributed to the investors recognizing their stake in the business and cooperation. The remaining part of the profit (after paying the dividend) is retained by the firms for reinvestment in the ongoing and future activities. Dividends are paid primarily to allure the investors who perceive the same as a sign of company's growth and steady income out of their investment (Khan et al., 2019). However, the decisions on dividend payment is a complex one that stands on conflicting perspectives. While a higher payment toward dividend is an indication of potential for monetary growth and a means for income for the investors, a lower dividend pay-out (DPO) enables the firms to use the surplus for future expansion of the business to provide a higher gain in future against the capital investment.

The discussions on formulation of the policy decisions for determining the DPO keeping in mind two contradictory objectives such as providing income opportunities to investors for attracting them for further investment and retaining earnings for future expansions and growth of the continuing business have been progressing over many decades. The researchers have been able to put forth several theories in this regard. Literature on the agency problem has advanced hypotheses on the relation between free cash flow and business performance. Research papers have also included variables reflecting the agency problem in their explanation for DPO. As DPO reduces the free cash flow available to companies, it is expected that this will reduce the incidence of the agency problem. The general argument that is advanced is that managers keep free cash and invest them in growth of companies to consolidate their position as a larger company has more activities and requires more people and more supervision. It is possible that these investments may not be justified and is against the interest of the shareholders. In this regard, it is also emphasized that expansion through debt is desirable as there is better monitoring by lenders and acts as a disciplinary tool for managers.

The dividend discount model of share price determination states that higher the DPO and its expected growth rate, higher is the value of the share of that company. That is DPO reflects income generation and helps in expectation formation for future growth. In other words, by declaring the dividends the companies provide an indication or signal to investors about the performance vis-à-vis income generation and prospects (Brigham & Houston, 2001). The purpose of declaration of dividends is to minimize the degree of asymmetry in information available to the internal parties (i.e., managers) and external (i.e., investors) shareholders (Lin et al., 2017; Hardy & Andestiana, 2019). A higher dividend transmits a positive signal to the investors while a lesser cash dividend payment provides a negative signal (Affandi et al., 2019).

It is true that companies that skip dividends or lowers the rate of dividend, are penalized by the market. This approach, therefore, relates DPO to expected future growth and does not focus on the agency problem per se. The agency problems stem from the agency cost which is defined as sum of the expenditures related to monitoring (due to governance of the activities of the agents by the principal) and bonding (to ensure that the interests of the principals are met by the agents) and residual loss in form of the opportunity cost due to the difference in the interests of the agents and the principals (Jensen & Meckling, 1976). Payment of dividend also means less retained earnings for reinvestment purposes and can signify that the company does not have any expansion plans in the near future. Thus dividend

payment can give conflicting signals. Rozeff (1982) made three propositions. First, the companies resort to paying lower dividends for reinforcing their investment plans and safeguarding from costly external finance. Secondly, in case of meeting short term obligations and fixed charges, companies with higher debt-equity ratio tend to lower the dividend payment. Finally, to lower the agency cost companies prefer to have lower DPO if there is a higher external shareholding. The problem of agency cost gets escalated when there is a conflict of interest between the managers (i.e., agents) and the shareholders (i.e., owners) where the principal's expectations are not reflected in the actions of the agents (Affandi et al., 2019). To this end, the agency cost can be minimized by striking a balance of the conflicting objectives of the agents and the principals. Dividend payment is one of the ways to reduce the agency conflict (Kilincarslan, 2021).

In this connection, Easterbrook (1984) explained that although companies find dividend payments obvious, this is all cost and no benefit to them. Dividends are taxed at a higher rate than capital gains which would result from investments of the retained earnings. Further, in the presence of dividend payments, external finance for investments would add cost to the company. However, companies paying dividends and simultaneously raising funds from the market is very common. This he states is a way shareholders reduce the monitoring costs of the managers. As a single shareholder is not in a position to monitor the activities of the managers, they rely on external fund providers to do the job for them. Paying dividends and raising external funds leads to a check on the nature of investments undertaken by the managers, while keeping the leverage unaltered. This is further elaborated in Jensen (1986). According to him, companies that are involved in new activities are the ones that have not been yet subject to disciplinary forces of the market and hence generate higher free cash flow. Such companies may move into riskier ventures or unrelated diversification. Debt as a substitute for dividends can control this agency problem. Baker et al. (2002) mentioned about four explanations behind DPO such as signalling, tax-preference (i.e., transactional), agency problem and bird-in-hand. The theory of bird-in-hand relies on short-term gain in terms of payment of dividends rather waiting for long-term capital gains under uncertainty (Widiyanti et al., 2019). To sum up, it is evidenced that disclosure of dividends and building the capabilities to pay the dividends can converge the theories. Investors look for a consistent and increasing DPO to get confidence about the appropriate utilizations of the funds invested in the company (Chaniago & Ekadjaja, 2022).

Therefore, we spot that there have been different schools of thoughts in explaining the motive and basis for taking dividend policies by the organizations. Further, it is an established fact that DPO has distinguished effect on firms' valuation at the market place vis-à-vis investors' behaviours and performance of the organizations. However, the evidence of a sizeable number of work continuously carried out over many decades in past suggest that the stated field has not been exhaustedly explored yet. This motivates us to undertake the current study that aims to find answers to the following research questions:

- RQ1. How can a model be formulated to compare a group of companies on the basis of several influencing factors of DPO?
- RQ2. To what extent do the firms differ from each other in terms of their capabilities to pay dividends subject to the influence of multiple indicative variables concerning the DPO?

In this paper we intend to carry out a comparative analysis of the dividend pay capabilities (DPC) of the FMCG and CD organizations listed in BSE, India over a period of FY 2013-14 to FY 2019-20. DPC of a particular company is defined as the final

appraisal score which is obtained considering the performance of the company with respect to the criteria (i.e., the factors that influence the dividend payment). A company with higher appraisal score is considered as having more capability (with respect to the criteria) in paying dividend as compared with the other available alternative options (i.e., companies). Since, we consider multiple factors grounded on theoretical foundations of dividend policy that affect the decisions of DPO, our work aims to build a MCDM model for the comparative analysis. MCDM models are particularly useful when a set of alternative choices are compared subject to the influence of a number of conflicting attributes or features or criteria to select the best possible choice(s) (Pamucar et al., 2021; Laha & Biswas, 2019). For the purpose of such kind of analysis we use a very recently developed MCDM algorithm such as LOPCOW (Ecer & Pamucar, 2022) for calculating of criteria weights and EDAS method (Keshavarz Ghorabaee et al., 2015) for final ranking.

The remaining part of the present paper is structured as follows. Section 2 is devoted for summarizing the observations and findings of some of the past work related to effect of the DPO on firm performance and determining factors for dividend payment. In section 3 we include a brief description of the data and methodology while section 4 provides the summary of the findings of the current work. Section 5 sheds light on the inferences and implications of the results through a brief discussion and in section 6 we make the concluding remarks alongside some scopes for future work.

2. Related Work

A plethora of research spanning over last several decades have been carried out by the researchers and the practitioners in the field of dividend policy and its effect on firm's performance (financial and market), value, shareholders' sentiments vis-à-vis the disclosure of the dividends and the underlying factors that influence the decision on DPO.

The principal objective of corporate financial management is to maximize the market value of equity shares. The key question of interest is: What is the relationship between dividend policy and market price of equity shares? The jury is still out on this unresolved issue in corporate finance. According to the traditional position enunciated by Graham and Dodd (1934), the stock market places considerably more weight on Dividends than on retained earnings. The Gordon model (Gordon, 1959) has shown that for firms, where the rate of return generated by the firm is greater than the rate of return required by shareholders, the price per share increases as the dividend payout ratio decreases and vice versa.

Miller and Modigliani (1961) expounded that the value of a firm depends solely on its earnings power and is not influenced by the manner in which its earnings are split between dividends and retained earnings. According to them dividends matter because of the uncertainty characterizing the future, the imperfections in the capital market and the existence of taxes. In real life different investors hold different views about future prospects and managers are better informed about future prospects than investors. Consequently, the information or signaling content of such dividend announcements. Muth's paper (Muth, 1961) says that what matters in economics is not what actually happens but the difference between what actually happens and what was supposed or expected to happen. Consequently, only surprises in policy would have the kind of effect the policy maker is striving to achieve. What happens if the dividend announced is higher than what was expected by the market? In such a situation the market revises its assessment of future earnings and would lead to an upward price movement in the share and vice versa. The academic thinking is that

the price changes that occur look like responses to dividends themselves, though they are caused by an underlying revision of the earnings potential. Mathematical models like the Walter model (Walter, 1963) have shown that the optimal payout ratio for a growth firm is nil. Clearly this leads to an extreme course of action which makes limited sense in the real world.

In most countries dividends are taxed more heavily than capital gains. Hence it can be argued that firms should pay little dividend so that investors earn more by way of capital gains. The tax laws in all countries favor capital gains in one more way. Taxes on dividends are payable immediately but taxes on capital gains are payable only when shares are sold. Consequently, the effective tax rate on capital gains diminishes as the period of holding increases. Brennan (1971) attempted to provide a connectivity between the Gordon's model and Miller and Modigliani framework.

Lintner (1956) made some very important observations. Mature firms with significant stable earnings have higher payout ratios, whereas fast growing firms have low payout ratios. Large FMCG companies may fall under this category. Dividends tend to follow earnings, but Dividends follow a smoother path than earnings. Transitory changes in earnings are not likely to have an impact on Dividend payment. Moreover, Dividends are sticky in nature as managers are reluctant to have a Dividend payout that may have to be reversed. A subsequent study by Fama and Babiak (1968) supported the Lintner model. In the subsequent studies, the authors (Black & Scholes, 1974; Asquith & Mullins, 1983; Lease et al., 1999) extended the explanations on how dividend yield and policy influence the stock price movements and impact of dividend intimations on stock price hike at the market place. There were a number of early contributions to discern the influence of industry, managers' views and other subsequent factors on dividend policy (Michel, 1979; Baker et al., 1985; Miller & Rock, 1985; Baker & Powell, 1999; Baker et al., 2001)

In the following sub-sections, we present a summary of some of the recently published research available in the extant literature where the first one discusses how are the dividend policy and DPO relevant and important for firms' market performances and valuations while in the second sub-section we enfold the findings of the past work to explore various determinants of the DPO.

2.1. Effect of dividend policy and DPO on firm performance

There has been a number of past research that attempted to establish the impact of dividend payment not only to bring new investments but also the enhance the firm's value and performance. For instance, Jiang et al. (2019) conducted an analysis over 210 stocks listed in Shanghai and Shenzhen 300 index, China and noted that the drop in the share prices is lower on the days of dividend payment. In another study, Taofeek et al. (2019) focused on dividend management on stock price movement in long run as well as short run. Five variables were used namely stock price volatility, dividend pay-out ratio, dividend yield, earnings volatility and firm size. This research considered non-financial sectors listed in Nigerian stock exchange. In this study the researcher highlighted that low dividend pay-out ratio serves as good signal to investors for expectation of return which increases the firm value. The work of Pandey and Narayani (2019) focused to explore the impact of DPO on the share price in Auto sector of India for a longitudinal spectrum of 12 years ranging from 2004 to 2016 encompassing the recession period 2008-09. Ten auto companies listed in NSE were considered and six variables were contemplated namely market share price as dependent variable and dividend yield, dividend pay-out ratio, earning retention ratio, earning per share and leverage. The researchers found out that dividend yield and DPO have a significant effect on share price in given time period. Odum et al.

(2019) attempted to find out the impact of DPO on firm's value. The research employed panel ordinary least square regression techniques on 11 beverages and breweries companies listed on Nigeria Stock Exchange covering ten years from 2007. As a manifestation of the values of the firm, five indicating variables such as profit after tax, cash holding, leverage ratio, dividend pay-out ratio and firm size were considered. Based on the findings form the study author recommended into order to increase the value of the firm, manager must ensure to increase PAT and leverage ratio. Puspitaningtyas (2019) tried to determine the effect of dividend announcement on stock return on the period 2017 in Indonesia stock market. 53 companies were considered in this research which were listed in Indonesia stock market who have announced cash dividend in consecutive during 2016-2017 and do not conduct corporate action other than announcement of dividend. Four criteria were considered namely actual return, expected return, abnormal return and average abnormal return for three time periods such as pre event i.e. 5 days before the event, event day and post event i.e. 5 days after the event. Researcher found that the market reacts to the announcement of dividend which is indicated by the existence of abnormal return value which is directly proportion to increase and decrease in dividends which strengths the perspective of signalling theory. The work of Omar and Echchabi (2019) examined the potential role of dividend pay-out plays in influencing the fund managers in selecting and recommending a stock. Semi-structured interview method was conducted with six Malaysian investment manager and the results indicates that other factors coupled with dividend pay-out pays a catalyst for investors and fund managers to select a stock in their portfolio. In the context of signalling theory, Salman (2019) worked on investigating the influence of shareholder preference and dividend signalling on the dividend policy of the corporations in Pakistan. Through a structured questionnaire based survey of 61 executives, the study reported that there are significant positive relationships between dividend policy and shareholder's preferences and dividend signalling.

In a recent work, Yin and Nie (2021) attempted to predict the returns of the stocks listed in Chinese market using raw and multiple adjusted dividend pay-out ratios (DPR). The research showed that stock returns can be positively predicted by DPR during the study period (2002-2018). In a different study, the researchers observed a moderating effect of the dividend policy on the causal relationship between profitability and value of the firm (Setyabudi, 2021). In the context of Nigeria, Ifeanyichukwu and Yusuf (2021) worked on examining the effect of the share dividends and cash dividend on the market price of the share during the time period 2014-2018. The authors observed a positive effect of cash dividend on share price at the market and also recommended the organizations to work for increasing the price-earnings ratio. Paying dividends to shareholders not adds to increase their wealth, but also helps to paying organizations to achieve sustainability in the long run (Sami & Abdallah, 2021). A policy with higher dividend payment increases the corporate value significantly (Dang et al., 2021). Dividend payment is associated with investors' sentiments that enhances the demand of the investors and eventually escalates the market return (Kumar et al., 2022). Seth and Mahenthiran (2022) further extended the growing volume of the literature to establish the relevance of the signals of CSR disclosure and DPO for maintaining long-term relationship with the shareholders that eventually enables the firms to become sustainable in future.

2.2. Determinants of DPO

Over the years the researchers from various countries have conducted several studies from various perspectives to find out the determinants of the DPO. In Amidu

and Abor (2006), the authors used financial statements for six consecutive years to find out the factors that affect the DPO decision for the organizations listed on the Ghana Stock Exchange. The authors considered two perspectives such as agency cost and opportunity for investments. It is evidenced in their work that profitability and cash flow hold positive associations with DPO while risk maintains the inverse relationship. In a later work, Hamill and Al-Shattarat (2012) tested the hypothesis of agency cost to discern the effect of ownership structure, free cash flow and firm size on DPR and observed significant influence. Mui and Mustapha (2016) had worked on public organizations in Malaysia and used multiple regression to conclude that investment opportunity, liquidity and size of the firm bear significant effect on DPO. The study of Khan et al. (2017) on Pakistani firms advocated for taxes and cash flow in addition to profitability as enablers of dividend policy. The authors conducted the study during 2003-2012 using panel regression. Based on their analysis over Chinese state controlled and non-state-controlled firms during a period of 10 years, Lin et al. (2017) realized that information asymmetry lowers the DPO. However, the authors observed evidence that for state controlled firms, higher information asymmetry leads to higher DPO. Continuing in the same direction, Malik and Sattar (2018) applied the Ordinary Least Square (OLS) method to figure out notable influence of governance related variables such as size of the board, CEO duality, ownership structure, size of the firm and operating cash flow on DPO for the companies in Pakistan. While working on 19 companies from Indonesian stock exchange during 2013-2015, Tumiwa and Mamuaya (2019) noted significant impact of firm size, profitability, and leverage on the DPO and stock price. The work of Le et al. (2019) supported the growing strand of work and revealed that profitability is positively related with DPO. However, the authors did not notice any notable influence of firm size, free cash flow, financial leverage and liquidity on dividend payment. Nidar et al. (2019) found positive influence of ownership structure and presence of independence in the board on DPR while they noticed insignificant and negative effect of board size. Budiarso (2019) extended the literature with their work on Indonesian consumer durable firms to investigate the footprints of profitability (variable: return on asset), efficiency (variable: growth of asset), risk (variable: debt ratio) and non-discretionary accruals and discretionary accruals on dividend policy using logistics regression over a period of 2010-2017. The author reported the consequential role of profitability for deciding the DPO. The extant literature further evidenced with the work of Lloren-Alcantara (2020) on Philippine-listed organizations during 2014-2018. The study pointed out the affirmative effects of profitability, liquidity and firm size but negative impact of the insider ownership on dividend payment. The authors argued for further work in this regard. In the recent works (Setyabudi, 2021; Salim & Aulia, 2021) the authors reflected in tune with past work and noted the significant associations of profitability, liquidity and leverage with DPO. Yakubu (2021) reported a positive causal association among working capital management through cash conversion cycle and days inventory outstanding with DPO based on a study made on a group of non-financial firms in Ghana during 2007 to 2016. Bakri et al. (2021) conducted a two period comparison of the determinants of DPO with respect to formal corporate governance mechanisms in Malaysian context and noted that profitability, lagged of dividends and firm size remain as a constant factor. Al Sawalqa (2021) worked on life cycle theory of DPO on selected Jordanian non-financial firms and noted the importance of asset value and shareholders' equity on determination of the dividend policy.

The study of Taher and Al-Shboul (2022) has focused on delving into the relationship of liquidity and dividend policy and found that an increase in liquidity

decreases the DPO. Chaniago and Ekadjaja (2022) figured out positive and significant impact of return on equity and ownership structure on DPR while they discovered insignificant and positive effect of cash ratio for the Indonesian firms. Novia and Marlina (2022) provided a contrasting result as they observed no effect of leverage and liquidity and negative impact of profitability on the dividend policy.

In Indian context, there have been a number of work in sync with the research at global platform. For example, Labhane and Das (2015) investigated for the trend and determinants of dividend policy for 239 firms listed on the National Stock Exchange (NSE), India over a period of 20 years. The authors put forth some interesting observations. First, the authors observed a decline in the number of companies that pay dividend while there had been a rise in the total amount paid in form of dividends over the study period. Secondly, the pattern of DPO varies across the industries. Finally, the authors concluded that given a conditions of higher free cash flow, better investment opportunities, larger size, age and profitability, and lower leverage, the firms tend to pay more dividends. In a later work (Singla & Samanta, 2018), it was found that profitability, life cycle and size lead to increase in dividend payment while cash flow exhibits negative relationship with DPO due to the presence of agency problem. Thakur and Kannadhasan (2018) applied quantile regression model to establish the differences in dividend payments by the companies due to changes in the profitability, growth, and size. In the work of Labhane and Mahakud (2019), 781 Indian organizations listed in NSE were examined for a period of 1995 to 2015 based on 14 variables related to profitability, efficiency, risk, liquidity, size, market capitalization and nature of business. The results highlighted the notable effect of the business group and profitability on DPO. Garg and Bhargaw (2019) diverted the stream of ongoing work by using Lintner's model and noted the effect of current year's earning on dividend payment for the Indian firms listed in the Bombay Stock Exchange (BSE). Katakwar et al. (2021) pointed out the positive impact of return on equity on DPO while they found risk and tax rate negative influence the dividend payments for NSE listed firms.

2.3. Motivations and Contributions of the Research

From the literature review we make out that the subject area is not an unknown one. There has been a continuous effort in introspecting the motives behind formulating the dividend policy and its impact on financial and market performance of the stocks and investors' behaviours. A steady growth in the volume of the literature is observed that deal with unveiling the determinants of the dividend payment in the context of leading indices of the global stock market while considering different types of the industries and firms. However, there is a scantiness in the work that considers multiple perspectives and provide a comprehensive multi-criteria based evaluation of a number of organizations to enfold the competitive positions with respect to their relative capabilities for paying dividends. It is evidenced in the extant literature that most of the past research have utilized time series based predictive models and frameworks to detect the causal associations. In this regard, the current work adds value to the growing literature in two ways.

Firstly, in Indian context the present paper may be considered as a work of its kind that provides a multi-period, multi-criteria based comparison of FMCG and CD companies with respect to the features rooted through the theoretical base of the dividend policy and findings of the previous work. Secondly, we present a new integrated framework of LOPCOW-EDAS methods for carrying out MCDM based analysis wherein we utilize the multiple aggregation methods. LOPCOW has not been explored for variety of applications yet.

3. Data and Methodology

In this paper, we aim to carry out a comparative analysis of the DPC of the selected organizations belonging to the FMCG and CD sectors listed in BSE, India. The present section discusses the selection of the sample, description of the criteria and methods used in the paper. Figure 1 depicts the flow of the steps followed in the current study.

3.1. Sample

In the present paper, we consider the FMCG and CD companies listed in BSE. We apply two filtrations. First, we discard all companies which are not listed in BSE during April 1, 2013 to March 31, 2020 (our study period is FY 2013-14 to FY 2019-20). Second, we calculate the average market capitalizations (over the study period) of the companies shortlisted at the first stage by using geometric mean. We select top 25 companies from FMCG group and top 5 firms from the CD sector. Therefore, our final sample consists of total 30 organizations (Table 1). These 30 organizations are the alternative options in our paper.

In the present paper we have adopted convenience sampling. We have considered the FMCG and CD sectors. FMCG aka consumer packaged products are regularly bought by the consumers and consumed by households in daily use. FMCG sector is characterized by a huge variety of household products with higher consumption and variable price range (lowest may be below INR 10), a large number of consumers (both from urban and rural markets), a diverse distribution network, lower penetration level (that lowers the entry and exit barriers), and a higher level of competition with presence of many domestic as well as multinational firms alongside unorganized players (Dhingra et al., 2018). In the decade the sector has undergone a transformational change because of technological progress, e-commerce, enhanced penetration to rural markets, Covid-19, and changing nature of the consumer behaviours which have posited promises for potential future growth and challenges for the organizations to design and deliver unique value propositions (TOI report, 2022). According to the recent report by Indian Brand Equity Foundation (IBEF report, 2022a) the estimated market potential for FMCG is USD 220 billion by 2025 with a CAGR of 14.9% while the projected value of the packaged food market in India is USD 70 billion. The observed rural spending is around 50 percent of the total spending in FMCG products. The FDI inflow in the last two years has been USD 20.11 billion.

On the other hand, CD refers to a group of products consumed by the household over a period of time such as kitchen appliances, electronic gadgets, home furnishing and leisure items etc. The products are classified under three broad categories: White Goods, Brown Goods and Consumer Electronics. The sector is also characterized by wide variety, a higher level of technology dependency, a mix of several domestic and multinational firms in addition to numerous unorganized and/or organized support firms and higher level of competition on brands. Given the developments in the software and hardware technology and enhanced disposable income, CD sector has emerged as one of dynamic and happening industry having a widespread awareness. With government initiatives (e.g., rural electrification and affordable housing schemes), CD products have a notable rural penetration too. In recent time, the sector has witnessed a FDI inflow of USD 3.19 billion (IBEF report, 2022b; Sarangi, 2019).

Considering the growth potential, familiarity to the households, variety of products, higher level of competition within the industry, promising amount of FDI,

and increased level of use at all levels of the society, have made the FMCG and CD sectors the sectors of interest for the investment decision analysis.

In the FMCG and CD sectors there are 72 and 10 listed companies respectively. Since, our study period starts from April 01, 2013, at the first level of filtration, we discard the companies that do not appear in the listing throughout the study period, i.e., got enlisted after April 01, 2013 and/or got discontinued before March 31, 2020. After the first level of filtration we obtain 60 companies from the FMCG and 09 firms from the CD sector. Now, we calculate the average market capitalization for all companies qualified at the first stage (i.e., 69 companies). We use geometric mean (GM) for calculating the average as GM is acceptable than the arithmetic mean in presence of outliers, if any. Since any of the 69 companies did not have any missing and/or zero value for the market capitalization, GM is also justified in use. After obtaining the average market capitalization, we select top 25 organizations from the FMCG (out of 60) and top 5 companies from the CD (out of 9) sectors. Here, our final sample consists of more than 30 percent of the total elements available in the population. The total size of the final sample is 30. The extant literature has advocated for 30 as a minimum standard size of the sample in sync with the central limit theorem, n-hat and n-omega methods (Roscoe, 1975; Luanglath & Rewtrakunphaiboon, 2013; Louangrath, 2014; Luanglath, 2014; Agresti & Kateri, 2021). Hence, the sample size used in this paper satisfies the minimum requirement.

3.2. Criteria Description

In line with past work, we select the criteria for carrying out the comparative analysis of DPC of the sample organizations. For example, the extant literature shows that Institutional ownership (IO) plays a momentous role in corporate governance. The distribution pattern of IO is one of the significant enablers for supporting the organizations in maintaining the optimum cash holding vis-à-vis agency cost issue to safeguard the interest of the investors. with the cash holding by the organizations. In this context, a higher % of non-promoter ownership reduces the cash holdings and thereby support the objective of "Efficient Monitoring Hypothesis (EMH)" as observed by Gupta and Bedi (2020). The size of the organization has a positive impact on the profitability of the firm (Hirdinis, 2019). Profitability indicates the earnings prospect of the firms that favours the dividend pay-out (Dewasiri et al., 2019). However, earning is supported by the growth. A growing organization has a better prospect of earnings in future. Hence, growth is an important enabler of dividend pay-out. Liquidity in terms of free cash flow (FCF) on the other hand has a positive effect on the dividend policy (Rochmah & Ardianto, 2020; Pattiruhu & Paais, 2020). According to the signalling theory, dividend is an indicator of the potential earnings in future. However, the uncertainties due to business risk blur the future earning prospect. Therefore, risk negatively influences the DPO (Hamill & Al-Shattarat, 2012). Therefore, leverage as a measure of risk undermines DPO. The criteria that are used in the current work for comparing the FMCG and CD organizations are summarized in Table 2.

Table 1. List of companies under comparison

S/L	Company	Category	S/L	Company	Category
A1	Avanti Feeds Ltd.	FMCG	A16	I T C Ltd.	FMCG
A2	Bajaj Consumer Care Ltd.	FMCG	A17	Jyothy Labs Ltd.	FMCG
A3	Bombay Burmah Trdg. Corpn. Ltd.	FMCG	A18	K R B L Ltd.	FMCG
A4	Britannia Industries Ltd.	FMCG	A19	Marico Ltd.	FMCG
A5	C C L Products (India) Ltd.	FMCG	A20	Nestle India Ltd.	FMCG
A6	Colgate-Palmolive (India) Ltd.	FMCG	A21	Procter & Gamble Hygiene & Health Care Ltd.	FMCG
A7	Dabur India Ltd.	FMCG	A22	Radico Khaitan Ltd.	FMCG
A8	E I D-Parry (India) Ltd.	FMCG	A23	Tata Consumer Products Ltd.	FMCG
A9	Emami Ltd.	FMCG	A24	United Breweries Ltd.	FMCG
A10	Future Consumer Ltd.	FMCG	A25	Zydus Wellness Ltd.	FMCG
A11	Gillette India Ltd.	FMCG	A26	Rajesh Exports Ltd.	CD
A12	Godfrey Phillips India Ltd.	FMCG	A27	Symphony Ltd.	CD
A13	Godrej Consumer Products Ltd.	FMCG	A28	Titan Company Ltd.	CD
A14	Hatsun Agro Products Ltd.	FMCG	A29	Voltas Ltd.	CD
A15	Hindustan Unilever Ltd.	FMCG	A30	Whirlpool Of India Ltd.	CD

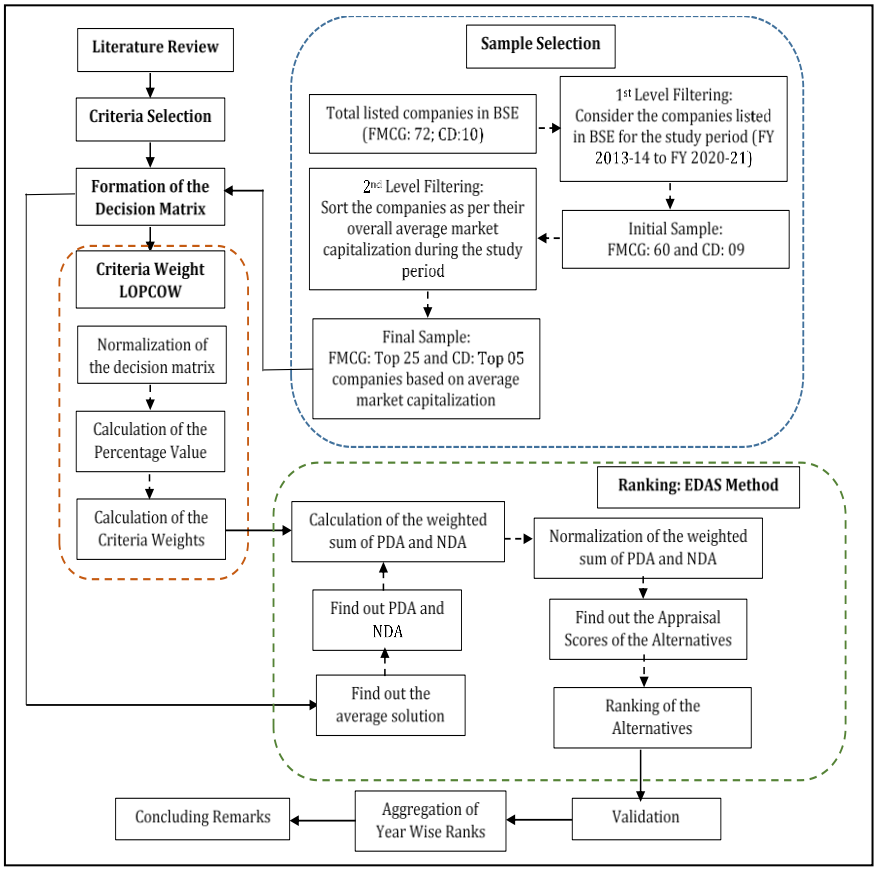

Figure 1. Research Framework

It is evident from the literature review that for better governance and utilization of the surplus earned from the business operations, the organizations need to be under independent vigilance. An increase in the percentage of shareholding by the non-promoters may reduce the excessive cash holding and the possibility of misuse by the agents (i.e., managers) and hence address the agency cost problem, if any. Hence, in this study we take % ownership by non-promoters as a proxy of IO. For an effective management of cash and earnings, IO should be maximized. A company with greater amount of total assets is likely to operate with freedom. It is also an indication of company's financial wellbeing and future prospect. Hence, size which is a natural log of total assets is treated as beneficial for building DPC. It is amply evident from the past work that a more profitable firm is likely to be capable for enhancing dividend payout. Therefore, all profitability indicators are considered as of maximizing nature with respect to DPC. The same explanations hold true for the growth variables for having a better DPC. Hence, all growth indicators are mentioned in the maximizing direction. If an organizations are having greater liquidity, the short run obligations can be made. Further, liquidity also indicates efficiency in business operations in generating cash. Therefore, NCF is considered in the maximizing direction. Finally, a firm can operate with stability for long run growth, if the debt is lower than the profit. To this end, leverage (considered as a proxy indicator of risk) is considered as a non-beneficial criterion with respect to DPC in this paper for which we set minimizing objective.

Table 2. List of criteria

Dimension	Criteria	Definition	Code	Effect Direction	UOM
Ownership	Institutional Ownership (IO)	% ownership by Non-promoters	C1	Maximize	%
Size	Size of the Firm (S)	Natural Log of total assets	C2	Maximize	Value
Profitability	Net Profit Margin (NPM)	(Net Profit/ Revenue)*100%	C3	Maximize	%
	Return on Capital Employed (ROCE)	(PBIT/Capital Employed)*100%	C4	Maximize	%
Growth	Sales Growth (SG)	Natural Log of (Sales at t / Sales at (t-1))	C5	Maximize	Value
	Market Cap/ Enterprise Value (MCEV)	Market capitalization/ Enterprise Value	C6	Maximize	Times
Liquidity	Net Cash Flow (from operating activities) (NCF)	Net amount of money being generated from regular business operations	C7	Maximize	Rs. Million
Risk	Leverage (L)	Debt/ PBITDA	C8	Minimize	Times

3.3. Data

The total spectrum for study has been selected as 10 years, i.e., FY 2012-13 to FY 2021-22. However, FY 2012-13 has been considered as a base year for the calculation of the year on year growth attributes (for example, Sales Growth). Further, FY 2020-21 and 2021-22 have been the periods affected by the "black swan" event, Covid-19 which impacted the stock market unprecedentedly and yet we believe may not be suitable to be considered for a stable analysis. Hence, the study period is effectively selected as FY 2013-14 to FY 2019-20. The data for finding out various indicating criteria for the companies under study have been collected from CMIE Prowess IQ (version 1.96). Accordingly, the decision matrices for the financial years (i.e., FY 2013-14 to FY 2020-21) have been constructed using the definitions as mentioned in the Table 2. The study period spans over FY 2013-14 to FY 2019-20. In our paper we

have not considered the period FY 2020-21 as the same is characterized by an unprecedented disruption because of the rapid spread of Covid-19. During this 'black swan' period there has been a massive impact on socio-cultural and economic environment across the globe. Hence, for a deeper understanding of the comparative DPC of the companies under study, we have selected a considerably uninterrupted period.

3.4. Criteria Weight Calculation: LOPCOW Method

The LOPCOW method calculates the criteria weights based on objective information (Ecer & Pamucar, 2022). It provides the following advantages

- The criteria weights are comparatively even in distribution
- Negative performance values of the alternatives can be used in deriving the criteria weights. This is a useful feature in many complex real-life scenarios such as stock returns.
- Ability to work efficiently with a large number of criteria and alternatives

Let, $X = \left[x_{ij} \right]_{m \times n}$ be the decision-matrix where, m is the number of alternatives (i.e., companies under comparison; m=30) and n is the number of criteria (in our case, $n = 8$). In what follows are the computational steps (Ecer & Pamucar, 2022)

Step 1. Normalization of the decision-matrix

Using the linear max-min type of normalization, we obtain the normalized decision matrix as given by

$R = \left[r_{ij} \right]_{m \times n}$ where,

$$r_{ij} = \frac{x_{ij} - x_{\min}^{j}}{x_{\max}^{j} - x_{\min}^{j}} \quad \text{(when } j \in j^{+}\text{, desired effect: maximizing)} \tag{1}$$

$$r_{ij} = \frac{x_{\max}^{j} - x_{ij}}{x_{\max}^{j} - x_{\min}^{j}} \quad \text{(when } j \in j^{-}\text{, desired effect: minimizing)} \tag{2}$$

Step 2. Derive the Percentage Value (PV) for the criteria

The PV for each criterion is given by the natural log of the mean square value as a proportion of the standard deviation expressed in percentage. This step helps to reduce the uneven distribution of the weights. Accordingly, PV is calculated as

$$P_j = \left| \ln \left(\frac{\sqrt{\frac{\sum_{i=1}^{m} r_{ij}^{2}}{m}}}{\sigma} \right) .100 \right| \tag{3}$$

σ denotes the standard deviation

Step 3. Computation of criteria weights

The weight for the j^{th} criterion is given by

$$w_j = \frac{P_{ij}}{\sum_{j=1}^{n} P_{ij}} \quad (4)$$

Where, $\sum_{j=1}^{n} w_j = 1$ (i.e., sum of the weights of all criteria = 1)

3.5. EDAS Method

EDAS considers average solution as a yardstick for figuring out the suitability of the alternatives. In this method, two distances used such as PDA (positive distance from the average) and NDA (negative distance from the average) are calculated subject to the desired effect of the corresponding criterion, i.e. maximizing and minimizing. The alternative, which has higher PDA and/or lower NDA, is considered as the best alternative among the others (Keshavarz Ghorabaee et al., 2015). EDAS has been applied in various real-life problems concerned with selection of best possible alternatives subject to influence of a set of criteria, for example, performance based selection of mutual funds (Karmakar et al., 2018), carpenter manufacturer selection (Stević et al., 2018), resource selection under dynamic environment for crowd computing for smartphones (Pramanik et al., 2021), green supplier selection (Wei et al., 2021), strategic decision for international market selection (Zolfani et al., 2021), 3D printer selection in digital manufacturing (Lei et al., 2022), and green financing (Su et al., 2022) among others. In what follows are the advantages of the EDAS method:

- EDAS is useful method in the situations with fluctuations in the performance values
- It does not consider the extreme solutions for benchmarking and therefore, it works fine in realistic situations
- Provides stable and reliable solutions (even with larger alternative and criteria sets) that are free from the rank reversal issues.

The procedural steps of the algorithm are as under.

Step 1. Formation of the decision matrix

The decision matrix is represented as

$$X = \left[x_{ij} \right]_{m \times n} = \begin{pmatrix} x_{11} & \cdots & x_{1n} \\ \vdots & \ddots & \vdots \\ x_{m1} & \cdots & x_{mn} \end{pmatrix} \quad (5)$$

Where, $m = 30$ is the number of alternatives and $n = 8$ is the number of criteria.

x_{ij} is the performance value of the i^{th} alternative subject to the j^{th} criterion.

Step 2. Derive the average solution

The average solution is derived as

$$\overline{x_j} = \frac{\sum_{i=1}^{m} x_{ij}}{m}; \; j = 1, 2, \ldots n \tag{6}$$

Step 3. Derive the PDA and NDA

The PDA and NDA are calculated by using the following expressions

PDA:

$$d_{ij}^{+} = \left.\begin{array}{l} \dfrac{Max(0,(x_{ij} - \overline{x_j}))}{\overline{x_j}}; \forall j \in j^{+} (\max imizing) \\ \dfrac{Max(0,(\overline{x_j} - x_{ij}))}{\overline{x_j}}; \forall j \in j^{-} (\min imizing) \end{array}\right\} \tag{7}$$

NDA:

$$d_{ij}^{-} = \left.\begin{array}{l} \dfrac{Max(0,(\overline{x_j} - x_{ij}))}{\overline{x_j}}; \forall j \in j^{+} (\max imizing) \\ \dfrac{Max(0,(x_{ij} - \overline{x_j}))}{\overline{x_j}}; \forall j \in j^{-} (\min imizing) \end{array}\right\} \tag{8}$$

Step 4. Calculation of the weighted sum of PDA and NDA values for all alternatives subject to the criteria

The weighted sums are calculated as

$$S_i^{+} = \sum_{j=1}^{n} w_j d_{ij}^{+} \tag{9}$$

$$S_i^{-} = \sum_{j=1}^{n} w_j d_{ij}^{-} \tag{10}$$

Here, w_j is the weight of the j^{th} criterion.

Step 5. Normalization of the weighted sum of PDA and NDA values

The normalization is done as under

For weighted sum of PDAs:

$$NS_i^{+} = \frac{S_i^{+}}{\underset{i}{Max}(S_i^{+})} \tag{11}$$

For weighted sum of NDAs:

$$NS_i^{-} = 1 - \frac{S_i^{-}}{\underset{i}{Max}(S_i^{-})} \tag{12}$$

Step 6. Computation of the appraisal score of the alternatives

The appraisal score of the i^{th} alternative is computed as

$$S_{ai} = \frac{1}{2}(NS_i^+ + NS_i^-) \quad (13)$$

Here, $0 \leq S_{ai} \leq 1$

Step 7. Ranking of the alternatives

The alternatives are ranked as per their appraisal scores. Higher is the score, more preferred is the corresponding alternative.

3.6. Aggregation of the MCDM results

In many real-life MCDM applications arriving at a consensus decision is a critical issue (Biswas, 2020a). The problem arises when a group of opinion makers or a set of different MCDM algorithms are involved in selection of a best possible alternative. To aggregate the outcomes of different decision making frameworks, the researchers have developed a number of algorithms. In this section, we discuss some of the approaches.

3.6.1. Borda Count (BC)

BC is an age old established preference based aggregation method (Borda, 1784) that has been applied for consolidation of the ranking results of various MCDM algorithms (Lansdowne & Woodward, 1996; Wu, 2011; Pourjavad & Shirouyehzad, 2011; Gandhi et al., 2018; Barak & Mokfi, 2019; Ecer, 2021). In what follows are the steps for this aggregation method.

Step 1. The ranking of the alternatives (subject to the influence of the criteria) is made by each opinion maker or method.

Step 2. Suppose, there are m alternative options. Each alternative is given a point equal to the number of options succeeding the considered one. Hence, the most preferred or best alternative receives $(m-1)$ points while the second best alternative gets $(m-2)$ points and so on.

Step 3. Calculation of the sum of the points obtained by each alternative option

Step 4. Ranking of the alternatives based on the total points. The alternative which obtains the highest points would be ranked first and so on.

3.6.2. Copeland Method (CM)

The CM is the extended and modified form of BC. The CM starts after the BC. This method puts emphasis on the number of other alternative options subordinated to the given alternative (Lestari et al., 2018; Dortaj et al., 2020; Ecer, 2021). The procedural steps are as follows.

Step 1. Computation of the win score for each alternative (vis-à-vis the others)

Step 2. Computation of the loss score (after subtracting of the score obtained in the first stage from majority wins' score)

Step 3. Calculation of the final score which is the difference between the win and loss scores. The alternative that obtains the highest overall score will be ranked first and so on.

3.6.3. Grade Average Method (GAM)

This is a simple method of aggregation of the ranks by various models. According to this method, the alternatives are ranked using the different methods. Then, for each alternative, an average of ranks or grades (obtained by using various models) is calculated. The alternative that scores least grade average, overall is the first preferred one (Dortaj et al., 2020).

In the present paper, for calculation purpose, we have used MS Office (2016) and SPSS (version 25) software tools on a computer with Intel(R) Core(TM) i3-1005G1 CPU @ 1.20GHz 1.19 GHz, 8GB RAM.

4. Results

In this section, we briefly highlight the findings step by step. First, we carry out the calculations for year wise criteria weights using the procedural steps of the LOPCOW method (see expressions (1) to (4), section 3.4). Table 3 provides the normalized decision matrix while Table 4 exhibits the calculations of the criteria weights using LOPCOW for FY 2013-14.

Table 3. Normalized decision matrix (for LOPCOW method) for FY 2013-14

Company	Criteria							
	C1	C2	C3	C4	C5	C6	C7	C8
A1	0.4344	0.0577	0.1501	0.2905	1.0000	0.2794	0.2799	0.9185
A2	0.0000	0.1219	0.5079	0.2556	0.4407	0.2912	0.2874	0.9878
A3	0.1216	0.0990	0.0193	0.0045	0.4562	0.2843	0.2774	0.3190
A4	0.3245	0.3660	0.1313	0.3296	0.4598	0.2892	0.3377	0.9632
A5	0.4075	0.1086	0.2871	0.1359	0.3695	0.2735	0.2836	0.9028
A6	0.3211	0.4183	0.2979	0.7412	0.4771	0.2892	0.3218	0.9554
A7	0.0851	0.5086	0.3227	0.3064	0.4549	0.2892	0.3484	0.9019
A8	0.3979	0.5389	0.0000	0.0000	0.1891	1.0000	0.2893	0.2103
A9	0.0302	0.3151	0.4217	0.2989	0.3670	0.2931	0.3136	0.9695
A10	0.4530	0.2476	0.1680	0.0293	0.4402	0.2902	0.2639	0.0000
A11	0.0000	0.2481	0.0613	0.0555	0.4896	0.2902	0.2842	0.6220
A12	0.0528	0.3728	0.1069	0.1140	0.4908	0.2912	0.3041	0.8387
A13	0.1564	0.5793	0.3124	0.1506	0.4711	0.2873	0.3523	0.7436
A14	0.0003	0.1994	0.0757	0.1078	0.4892	0.2735	0.2950	0.8825
A15	0.1037	0.7721	0.2792	1.0000	0.4151	0.2902	0.6624	0.9976
A16	1.0000	1.0000	0.4348	0.3062	0.4525	0.2912	1.0000	0.9688
A17	0.1100	0.3675	0.1883	0.0664	0.5628	0.2775	0.2895	0.6293
A18	0.2188	0.4402	0.2255	0.1121	0.6764	0.2353	0.2521	0.7968
A19	0.2048	0.5085	0.3594	0.1907	0.4128	0.3078	0.3009	0.8562
A20	0.1638	0.6208	0.2833	0.2935	0.4254	0.2873	0.4567	0.9738
A21	0.0583	0.3215	0.3401	0.2890	0.5574	0.2892	0.3091	0.9539
A22	0.4621	0.3827	0.0504	0.0332	0.5637	0.2569	0.2884	0.6911
A23	0.5116	0.5671	0.1995	0.0704	0.4926	0.3039	0.2895	0.7106
A24	0.0024	0.5193	0.0752	0.0653	0.4458	0.2824	0.3044	0.7568
A25	0.0329	0.0609	1.0000	0.2661	0.2452	0.2961	0.2833	0.8777
A26	0.2940	0.7343	0.0265	0.0365	0.0000	0.0000	0.0000	0.1537
A27	0.0000	0.0000	0.5091	0.4015	0.7822	0.2931	0.2827	1.0000
A28	0.2937	0.6119	0.1668	0.2441	0.4027	0.2873	0.2166	0.8155
A29	0.5981	0.5341	0.0802	0.0842	0.2180	0.2961	0.3089	0.3508
A30	0.0000	0.3300	0.0938	0.1544	0.3287	0.2980	0.2954	0.7640

Table 4. Criteria weights (FY 2013-14) – LOPCOW method

	C1	C2	C3	C4	C5	C6	C7	C8
Mean Square	0.1042	0.2119	0.0976	0.0904	0.2351	0.1100	0.1308	0.6358
SD	0.2325	0.2344	0.2044	0.2143	0.1771	0.1427	0.1593	0.2742
PV	32.8284	67.4634	42.4134	33.8469	100.7452	84.3134	81.9621	106.7331
W_j	0.0597	0.1226	0.0771	0.0615	0.1831	0.1532	0.1489	0.1940

Table 5 provides the summary of the criteria weights for all years. The orders of the criteria (as per their relative importance) for different years are given in Table 6. It is noticed that leverage (i.e, risk) obtains the higher priority while liquidity in most of the cases holds the less weight. We now use these weights to compare and rank the companies under study using EDAS method.

Table 5. Year wise criteria weights – summary

FY	Criteria Weights							
	C1	C2	C3	C4	C5	C6	C7	C8
2013-14	0.0597	0.1226	0.0771	0.0615	0.1831	0.1532	0.1489	0.1940
2014-15	0.0986	0.1891	0.2256	0.1537	0.1479	0.1272	0.0394	0.0186
2015-16	0.0596	0.1148	0.1515	0.0984	0.1533	0.1779	0.0165	0.2279
2016-17	0.0749	0.1216	0.1643	0.1411	0.1908	0.0074	0.0241	0.2759
2017-18	0.0601	0.1060	0.1818	0.1124	0.1553	0.0019	0.0990	0.2835
2018-19	0.0564	0.0952	0.1225	0.0765	0.2130	0.2299	0.0199	0.1867
2019-20	0.0751	0.1072	0.1788	0.0840	0.0919	0.2119	0.0157	0.2355
2020-21	0.0459	0.0624	0.1604	0.0734	0.1653	0.1774	0.1359	0.1792

Table 7 exhibits the average solution for the criteria for the FY 2013-14 (using the expression (6)). Table 8 provides the calculation of the appraisal scores of the alternatives (using the expressions (7) to (13)) for the FY 2013-14. The ranking order of the alternatives are also included in Table 8. In the similar way we find the ranking order of the alternatives for all other financial years.

Table 6. Year wise criteria weights – priority order

FY	Priority order
2013-14	$C_8 \succ C_5 \succ C_6 \succ C_7 \succ C_2 \succ C_3 \succ C_4 \succ C_1$
2014-15	$C_3 \succ C_2 \succ C_4 \succ C_5 \succ C_6 \succ C_1 \succ C_7 \succ C_8$
2015-16	$C_8 \succ C_6 \succ C_5 \succ C_3 \succ C_2 \succ C_4 \succ C_1 \succ C_7$
2016-17	$C_8 \succ C_5 \succ C_3 \succ C_4 \succ C_2 \succ C_1 \succ C_7 \succ C_6$
2017-18	$C_8 \succ C_3 \succ C_5 \succ C_4 \succ C_2 \succ C_7 \succ C_1 \succ C_6$
2018-19	$C_6 \succ C_5 \succ C_8 \succ C_3 \succ C_2 \succ C_4 \succ C_1 \succ C_7$
2019-20	$C_8 \succ C_6 \succ C_3 \succ C_2 \succ C_5 \succ C_4 \succ C_1 \succ C_7$

Table 7. Average solution (FY 2013-14)

Criteria	C1	C2	C3	C4	C5	C6	C7	C8
Avg. Sol.	42.0386	9.9983	9.8703	25.081	0.1114	1.1347	4970.837	6.488

Table 8. Ranking of alternatives (FY 2013-14)

Company	S+	S-	NS+	NS-	Si	Rank
A1	0.8600	0.2105	0.3817	0.9113	0.6465	3
A2	0.2170	0.1798	0.0963	0.9242	0.5103	12
A3	0.0049	0.5360	0.0022	0.7740	0.3881	27
A4	0.1920	0.0527	0.0852	0.9778	0.5315	10
A5	0.1101	0.3097	0.0489	0.8695	0.4592	22
A6	0.3161	0.0274	0.1403	0.9885	0.5644	6
A7	0.2028	0.0306	0.0900	0.9871	0.5385	8
A8	0.9898	0.8649	0.4393	0.6354	0.5374	9
A9	0.1923	0.1861	0.0853	0.9215	0.5034	13
A10	0.0239	0.6651	0.0106	0.7196	0.3651	29
A11	0.0496	0.3346	0.0220	0.8590	0.4405	24
A12	0.0948	0.1677	0.0421	0.9293	0.4857	16
A13	0.1351	0.0475	0.0600	0.9800	0.5200	11
A14	0.1144	0.2460	0.0508	0.8963	0.4735	20
A15	1.3503	0.0775	0.5994	0.9673	0.7834	2
A16	2.2528	0.0128	1.0000	0.9946	0.9973	1
A17	0.1476	0.2699	0.0655	0.8862	0.4759	19
A18	0.3251	0.3370	0.1443	0.8580	0.5011	14
A19	0.1083	0.1346	0.0481	0.9432	0.4957	15
A20	0.5365	0.0613	0.2382	0.9742	0.6062	5
A21	0.2954	0.0865	0.1311	0.9635	0.5473	7
A22	0.1737	0.3120	0.0771	0.8685	0.4728	21
A23	0.0985	0.1788	0.0437	0.9246	0.4842	17
A24	0.0103	0.2165	0.0046	0.9087	0.4567	23
A25	0.3267	0.4470	0.1450	0.8116	0.4783	18
A26	0.0268	2.3722	0.0119	0.0000	0.0059	30
A27	0.7069	0.1821	0.3138	0.9232	0.6185	4
A28	0.0602	0.4227	0.0267	0.8218	0.4243	26
A29	0.0473	0.6561	0.0210	0.7234	0.3722	28
A30	0.0067	0.3502	0.0030	0.8524	0.4277	25

Table 9 provides the summary of the year wise rankings which reflect that there have been some considerable irregularities in the ranking orders of the alternatives.

Table 9. Summary of year wise ranking of the companies

Company	Rank						
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
A1	3	8	2	7	2	26	9
A2	12	7	11	6	11	10	8
A3	27	29	30	30	30	25	29
A4	10	14	7	9	14	15	13
A5	22	17	21	18	12	27	10
A6	6	4	10	10	19	19	11
A7	8	11	17	19	18	12	14
A8	9	1	9	27	28	29	28
A9	13	5	12	14	21	22	21
A10	29	30	27	29	5	13	1
A11	24	22	23	17	23	16	25
A12	16	25	26	12	25	30	7
A13	11	15	19	20	17	9	16
A14	20	26	5	11	26	20	24
A15	2	3	4	4	3	5	5
A16	1	2	3	2	1	6	3
A17	19	19	20	21	27	23	27
A18	14	20	16	25	22	3	15
A19	15	9	13	16	9	11	18
A20	5	13	29	5	10	8	6
A21	7	12	14	8	15	2	12
A22	21	27	1	23	6	1	19
A23	17	21	22	26	20	24	4
A24	23	24	6	24	8	17	26
A25	18	6	8	3	4	14	30
A26	30	28	25	28	29	4	20
A27	4	10	18	1	13	28	2
A28	26	16	28	15	7	7	22
A29	28	23	24	22	24	18	23
A30	25	18	15	13	16	21	17

We notice that the alternatives do not hold consistent positions over the years of the study period. To set the overall preferential order, it is necessary to arrive at a consensus. To meet this objective, we apply the widely used aggregation of voting technique such as BC as described in section 3.6.1. We also use another popular method like CM to carry out the aggregation to validate the result of BC. Further, we formulate a new decision matrix using the appraisal scores of the alternatives each year. In this newly formed decision matrix all the years are assigned same weights (i.e., equal importance). Table 10 presents the decision matrix used for obtaining the overall ranking of the alternatives. We apply Simple Additive Weighting (SAW) method for deriving the overall ranks as followed in many past research (Biswas, 2020b; Pramanik et al., 2021).

Table 10. Decision matrix for overall ranking of the alternatives

Weight	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429
Models	Score Values						
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
A1	0.6465	0.5059	0.7904	0.6126	0.7993	0.5276	0.6147
A2	0.5103	0.5195	0.6576	0.6204	0.6235	0.7946	0.6173
A3	0.3881	0.0466	0.0000	0.1170	0.0000	0.5295	0.1992
A4	0.5315	0.4417	0.7217	0.6001	0.6042	0.7130	0.5810
A5	0.4592	0.3752	0.5353	0.5023	0.6065	0.5057	0.6134
A6	0.5644	0.5633	0.6684	0.5807	0.5506	0.6584	0.6098
A7	0.5385	0.4802	0.5905	0.4953	0.5676	0.7643	0.5799
A8	0.5374	0.8558	0.6924	0.2756	0.3544	0.3277	0.2807
A9	0.5034	0.5423	0.6307	0.5360	0.5237	0.5667	0.5116
A10	0.3651	-0.0342	0.4138	0.1395	0.7495	0.7582	0.8963
A11	0.4405	0.3029	0.4669	0.5188	0.5183	0.6890	0.4955
A12	0.4857	0.2362	0.4211	0.5457	0.4995	0.0642	0.6229
A13	0.5200	0.4384	0.5813	0.4922	0.5681	0.8194	0.5449
A14	0.4735	0.2026	0.7413	0.5656	0.4755	0.5892	0.5021
A15	0.7834	0.6031	0.7545	0.6856	0.7962	0.8985	0.7209
A16	0.9973	0.6479	0.7768	0.7339	0.8843	0.8878	0.7911
A17	0.4759	0.3611	0.5734	0.4655	0.4666	0.5407	0.4430
A18	0.5011	0.3575	0.5928	0.3601	0.5196	0.9232	0.5477
A19	0.4957	0.4949	0.6180	0.5234	0.6356	0.7791	0.5423
A20	0.6062	0.4680	0.3949	0.6206	0.6275	0.8371	0.6969
A21	0.5473	0.4698	0.5965	0.6028	0.6001	0.9278	0.5950
A22	0.4728	0.1913	0.9223	0.3799	0.6752	0.9285	0.5319
A23	0.4842	0.3254	0.5146	0.3512	0.5290	0.5406	0.7687
A24	0.4567	0.2692	0.7303	0.3696	0.6473	0.6781	0.4616
A25	0.4783	0.5383	0.7043	0.6883	0.7915	0.7196	0.0006
A26	0.0059	0.1620	0.4382	0.1747	0.2546	0.9225	0.5190
A27	0.6185	0.4912	0.5825	0.9695	0.6060	0.4094	0.8245
A28	0.4243	0.3918	0.4030	0.5352	0.6501	0.8469	0.5095
A29	0.3722	0.3025	0.4642	0.4323	0.5067	0.6764	0.5030
A30	0.4277	0.3700	0.5934	0.5360	0.5913	0.5780	0.5428

Table 11 exhibits the overall ranking of the alternatives using the BC method. We proceed to calculate the win score and loss score for each alternatives using the findings presented in Table 9 and the steps described in section 3.6.2 (CM) to derive the Copeland score and accordingly, rank the alternatives.

Table 11. Overall Rank (using Borda Count)

Company	Borda Count	Final Rank_ BORDA	Company	Borda Count	Final Rank_ BORDA
A1	153	3	A16	192	1
A2	145	4	A17	54	27
A3	10	30	A18	95	16
A4	128	9	A19	119	11
A5	83	19	A20	134	6
A6	131	8	A21	140	5
A7	111	13	A22	112	12
A8	79	21	A23	76	24
A9	102	15	A24	82	20
A10	76	23	A25	127	10
A11	60	26	A26	46	29
A12	69	25	A27	134	7
A13	103	14	A28	89	17
A14	78	22	A29	48	28
A15	184	2	A30	85	18

Table 12 provides the findings of the CM. We apply the regular procedural steps of the SAW method (Simanaviciene & Ustinovichius, 2010) and obtain the overall (after aggregating) ranks of the alternatives (refer Table 13).

Table 12. Overall Rank (using Copeland approach)

Company	Wins	Losses	Final Score	Final Rank	Company	Wins	Losses	Final Score	Final Rank
A1	153	2892	-2739	3	A16	192	2853	-2661	1
A2	145	2900	-2755	4	A17	54	2991	-2937	27
A3	10	3035	-3025	30	A18	95	2950	-2855	16
A4	128	2917	-2789	9	A19	119	2926	-2807	11
A5	83	2962	-2879	19	A20	134	2911	-2777	6
A6	131	2914	-2783	8	A21	140	2905	-2765	5
A7	111	2934	-2823	13	A22	112	2933	-2821	12
A8	79	2966	-2887	21	A23	76	2969	-2893	24
A9	102	2943	-2841	15	A24	82	2963	-2881	20
A10	76	2969	-2893	23	A25	127	2918	-2791	10
A11	60	2985	-2925	26	A26	46	2999	-2953	29
A12	69	2976	-2907	25	A27	134	2911	-2777	7
A13	103	2942	-2839	14	A28	89	2956	-2867	17
A14	78	2967	-2889	22	A29	48	2997	-2949	28
A15	184	2861	-2677	2	A30	85	2960	-2875	18

Table 13. Overall Rank (using SAW method)

Company	Final Rank_ SAW	Company	Final Rank_ SAW
A1	4	A16	1
A2	5	A17	24
A3	30	A18	16
A4	8	A19	11
A5	20	A20	7
A6	9	A21	6
A7	12	A22	10
A8	25	A23	22

Company	Final Rank_ SAW	Company	Final Rank_ SAW
A9	15	A24	19
A10	26	A25	14
A11	23	A26	29
A12	28	A27	3
A13	13	A28	17
A14	21	A29	27
A15	2	A30	18

Figure 2 pictorially represents the comparison of the overall ranking of the alternatives using BC, CM and SAW methods which reflects a consensus. We also calculate the correlations among the overall ranking by using BC method and others (Table 14) which indicates the consistency of BC method with others.

Table 14. Correlation Test among the rankings by BC, CM and SAW methods

		Final_Rank_Copeland	Final_Rank_SAW
Final_Rank_ BORDA	Spearman's rho	1.000**	.977**
	Sig. (2-tailed)	0.000	0.000

** Correlation is significant at the 0.01 level (2-tailed).

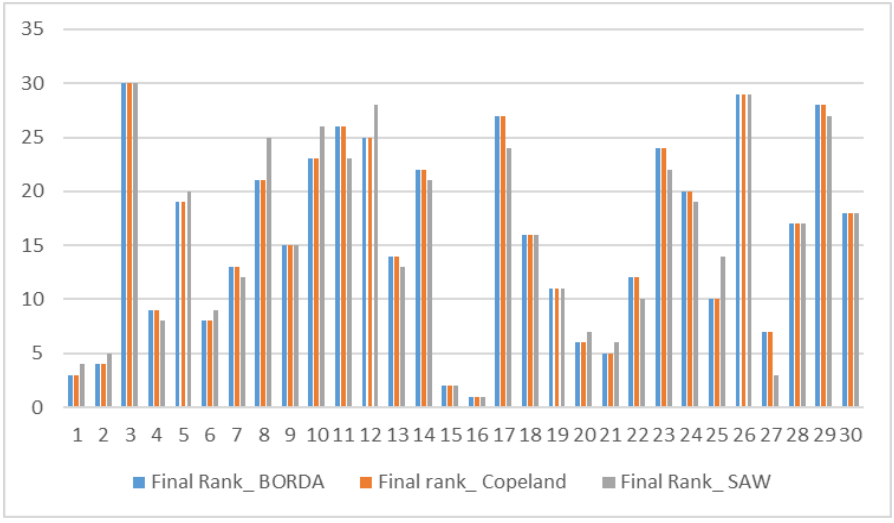

Figure 2. Comparison of overall ranks by BC, CM and SAW methods

We further test the consistency of the year wise ranking of the alternatives (obtained by using EDAS method) and the overall ranking (obtained by using BC method) as given in Table 15. We note that the correlation is statistically significant. Further, it is evident that FY 2013-14, FY 2016-17 and FY 2017-18 show higher consistency, FY 2015-16 and FY 2019-20 are moderately consistent and FY 2018-19 exhibits low consistency with the final ranking.

Table 15. Correlation test among the year wise rankings and the overall ranking

		Rank_ 13_14	Rank_ 14_15	Rank_ 15_16	Rank_ 16_17	Rank_ 17_18	Rank_ 18_19	Rank_ 19_20
Overall Rank	Spearman's rho	.816**	.744**	.588**	.780**	.720**	.370*	.507**
	Sig. (2-tailed)	0.000	0.000	0.001	0.000	0.000	0.044	0.004

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

MCDM methods are dependent on the given conditions such as selection of alternative and criteria sets, effects of the criteria on the alternatives, criteria weights, computational steps of the algorithms and so on. Therefore, it is imperative to examine whether the result obtained by using a specific MCDM method is reliable or not (Biswas et al., 2019; Gupta et al., 2019; Gupta et al., 2022; Biswas et al., 2022a). The extant literature shows several instances (Biswas & Pamučar, 2021; Biswas et al., 2021; Biswas et al., 2022b; Biswas & Anand, 2020) wherein the authors use a group of widely used methods to compare with the selected framework for the given problem. In our paper, we rank the alternatives using two other popular and extensively used MCDM models such as multi-attributive border approximation area comparison (MABAC) (Pamučar & Ćirović, 2015) and the COmplex PRoportional ASsessment (COPRAS) method (Zavadskas et al., 1994) for all years. Next, we use the BC method to derive the final ranks for both MABAC and COPRAS method. Then, we examine the correlations among the rankings (year wise and overall) provided by our framework (using EDAS), MABAC and COPRAS (Tables 16-18). The Tables 16-18 suggest that our EDAS based ranking is comparable and in sync with the other methods. Hence, there is a reason to consider our result as a reliable one.

Table 16. Rank correlation test (year wise) between EDAS and COPRAS

		EDAS_ 13_14	EDAS_ 14_15	EDAS_ 15_16	EDAS_ 16_17	EDAS_ 17_18	EDAS_ 18_19	EDAS_ 19_20
COPRAS_13_14	Spearman's rho	.993**						
	Sig. (2-tailed)	0.000						
COPRAS_14_15	Spearman's rho		.892**					
	Sig. (2-tailed)		0.000					
COPRAS_15_16	Spearman's rho			.928**				
	Sig. (2-tailed)			0.000				
COPRAS_16_17	Spearman's rho				.957**			
	Sig. (2-tailed)				0.000			
COPRAS_17_18	Spearman's rho					.964**		
	Sig. (2-tailed)					0.000		
COPRAS_18_19	Spearman's rho						.960**	
	Sig. (2-tailed)						0.000	
COPRAS_19_20	Spearman's rho							.821**
	Sig. (2-tailed)							0.000

** Correlation is significant at the 0.01 level (2-tailed).

Table 17. Rank correlation test (year wise) between EDAS and MABAC

		EDAS_13_14	EDAS_14_15	EDAS_15_16	EDAS_16_17	EDAS_17_18	EDAS_18_19	EDAS_19_20
MABAC_13_14	Spearman's rho	.905**						
	Sig. (2-tailed)	0.000						
MABAC_14_15	Spearman's rho		.683**					
	Sig. (2-tailed)		0.000					
MABAC_15_16	Spearman's rho			.453*				
	Sig. (2-tailed)			0.012				
MABAC_16_17	Spearman's rho				.916**			
	Sig. (2-tailed)				0.000			
MABAC_17_18	Spearman's rho					.731**		
	Sig. (2-tailed)					0.000		
MABAC_18_19	Spearman's rho						.663**	
	Sig. (2-tailed)						0.000	
MABAC_19_20	Spearman's rho							.749**
	Sig. (2-tailed)							0.000

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 18. Rank correlations among the final results by EDAS, MABAC and COPRAS

		MABAC_Final	COPRAS_Final
EDAS_final	Spearman's rho	.782**	.972**
	Sig. (2-tailed)	0.000	0.000

** Correlation is significant at the 0.01 level (2-tailed).

We further conduct a non-parametric statistical test such as Kruskal Wallis Test (KWT) to examine whether the distribution functions of EDAS, COPRAS and MABAC are significantly different. We find the value of the Asymp. Sig. as 1.00 which strongly supports the null hypothesis that the distribution functions of all methods are equal. Hence, the result obtained by EDAS method is further validated statistically.

5. Discussion

The current study reveals some interesting observations. Firstly, we see that when multiple criteria (ownership, size, profitability, growth, liquidity and risk) are considered for comparing the companies (i.e., FMCG and CD), the rankings are not consistent over the years. We observe that as per overall aggregated ranking, top two organizations such as A16 (ITC limited) and A15 (Hindustan Unilever Ltd) hold their positions more or less consistent. The same behavior is noticed for the bottom three organizations such as A3 (Bombay Burmah Trdg. Corpn. Ltd), A26 (Rajesh Exports Ltd.) and A29 (Voltas Ltd). Looking at the nature of these organizations, we find that market capitalization for the top two capable organizations are higher than others. In addition, both A16 and A15 are having multi-product portfolio with strong global presence. Further, it is seen that FMCG organizations are in the top bracket as far as DPC is concerned. The companies in the bottom bracket are mostly CD firms. The result is an indication that organizations producing luxury goods may tend to be less capable in paying the dividends. Further, we figure out that FY 2018-19 shows

considerably higher variations in the usual rankings of the companies. It may be an indirect effect of the declaration of the GST bill in India and demonetization initiative by the Government of India.

The present study has some significant implications. From the theoretical point of view, the current study is a distinguished work for comparing the firms on the basis of their DPC. So far, studies have been made to explore the effect of dividend payment on the firms' performance and their values and to enfold the determinants of the dividend policy. But, the question arises, are the firms capable enough to pay dividends? Therefore, this paper provides a holistic multi-perspective analysis framework to gauge the capabilities of the firms beforehand. We have noticed that DPC varies significantly over the years. Hence, although the firms may realize the importance of paying dividend as a positive signal to the investors, they may not be equally capable of the providing the same over the years. Hence, there is a need of striking a balance between the principal's interest and manager's decisions.

Further, the present paper has its importance from the perspectives of behavioral finance also. Despite the tax disadvantage of Dividends (typically dividend income is taxed more than capital gains) and issuance cost associated with new equity, firms pay Dividends and investors generally regard such dividend payments positively. Information signaling, clientele effect, agency costs are some important reasons. In addition, investors have preference for dividends due to behavioral reasons. Lack of self-control and aversion for regret could be important reasons. Consequently, dividends and capital receipts are not perfectly substitutable. The experts of the behavioral finance field (Kahneman & Tversky, 1979; Thaler & Shefrin, 1981; Shefrin & Statman, 1984) regarded the internal conflict as one of the major reasons behind such mismatch. The individual wishes to deny himself a present indulgence, yet simultaneously finds that he yields to the temptation. In the area of personal finance, individuals would like to protect their principal from their wasteful spending tendencies. A simple way to do this is to limit their spending to the dividend income so that the capital amount is preserved. Such behavioral nature explains a preference for dividend by those who otherwise have difficulty in exercising self-control. The individuals who set aside funds for their children's college education at one interest rate, yet borrow to finance their consumer goods at a higher interest rate, are not acting as standard utility maximizers. Yet the underlying rationale seems quite straightforward. Similarly, it implies that an individual may be better off by allowing current consumption to be determined by the dividend payout from his stock portfolio. In other words, this individual may wish to follow a rule stipulating that portfolio capital is not to be consumed, only dividends. Empirical evidence suggests that most investors feel more regret when they sell their stock to generate income compared to using the dividend income. Regret shall be more, if stock prices rise subsequently.

Therefore, despite all arguments and counter discussions related to dividend policy, DPO holds its importance in attracting the investors over the years. Hence, this paper puts forth a notable extension to the growing strand of work that renders a new direction to the individual investors and policy makers.

6. Conclusion

The present study has been designed to add a new dimension to the ongoing strand of literature on dividend policy and DPO. The current work has provided a multi-period, multi-criteria based framework to compare the DPC of 25 FMCG and 5 CD organizations (listed in BSE, India) for the period FY 2013-14 to FY 2019-20. For comparison purpose, we have considered six aspects (grounded on the extant

theories on dividend policy) such as ownership, size, profitability, growth, liquidity and risk. We have used a new integrated LOPCOW-EDAS framework for our analysis. The result shows that companies do not show consistent performance over the years. However, the aggregate overall performance is in sync with the market capitalization for most of the organizations. We further have noticed that FMCG organizations show comparatively better capabilities that CD firms vis-à-vis dividend payment. For aggregation (of the ranks for different years) we have used widely used techniques such as BC, CM in addition to SAW. The aggregated overall ranking shows consistency with the same obtained for individual years. As per the aggregated ranking the companies like A16: ITC limited; A15: Hindustan Unilever Ltd. A1: Avanti Feeds Ltd. A2: Bajaj Consumer Care Ltd. A21: Procter & Gamble Hygiene & Health Care Ltd. hold the top positions while A3: Bombay Burmah Trdg. Corpn. Ltd. A26: Rajesh Exports Ltd. A29: Voltas Ltd. A17: Jyothy Labs Ltd. A11: Gillette India Ltd. fall into the lower bracket.

However, the present work posits a number of further scope of research. Firstly, in this paper we have not considered subjective opinions of the investors in deriving the criteria weights. The criteria weights, though have been found by using objective information, but the susceptible to abrupt variations in the performance values of the alternatives. One general drawback of the opinion-based decision making is subjective bias. Hence, one future study may also take opinions of some seasoned investors and experts to derive the criteria weights which shall be aggregated with the weights found by using objective values. Then the same weights may be used to compare the companies for different years during the study period. Secondly, in our study we observe considerable variations in ranking for different years. One future work may attempt to gauge the impact of macroeconomic events during each FY and shall draw a causal association with the variations in the ranking. Thirdly, it shall be an interesting future work to examine whether DPC has any positive association with the stock market performance of the organizations under study here. Further, the present study may be extended to test whether sales and operational performance, innovativeness, financial stability and economic sustainability have any positive influence on DPC or not. Fourthly, in this paper we have not examined the impact of Covid-19 on DPC. A near future research may be designed in this regard by considering the FY 2020-21 and FY 2021-22. Fifthly, it may also be a notable work if an investigation may be made to find out the association of DPC and DPR and dividend yield. Sixthly, the current work focuses on FMCG and CD sectors. The same framework as used in this paper may be modified/extended for assessing the comparative DPC of the constituent firms belong to other sectors. Seventh, from the technical point of view, LOPCOW is very recently introduced. The method may be tested in other complex scenarios, especially under uncertainty wherein future research shall extend the model to work with imprecise information. Eighth, a future work may be done to compare a group of companies at the different phases of the business cycle and are managed differently (e.g., by professionals, promoter dominated, multinational governance etc.) with our model to obtain their DPC and subsequently relate to their DPO. Ninth, there is a possibility to examine the performance of the companies from behavioural perspectives vis-à-vis DPC. Tenth, there may be other measures of risk, for instance, cost of the capital employed, degree of operating leverage among others that may also be considered in further analysis.

The EDAS method has some limitations. EDAS method is more appropriate for risk neutral situations as it considers the average solution point as a benchmark. The average solution may not always portray the true picture in all real-life scenarios.

Further, in some occasions, it is seen that the NDA or PDA values for some alternatives equal to zero. In those cases, the weighted sum values become undefined.

Nevertheless, the above-mentioned scopes, we hope, will not lessens the value and potential of the present work. We believe that the current work shall contribute new dimensions and perspectives for the policy makers in business organizations and government and help the investors in investment decision making.

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