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SPENDING ON INTANGIBLES AND THE GROWTH OF PUBLIC SECTOR ENTERPRISES IN INDIA: A MEASURE-SPECIFIC DEA ANALYSIS

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ABSTRACT

A recent surge of intangible investment to navigatethe productive capability of Central Public Sector Enterprises (CPSEs) resurrected a range of doubt about the trajectory of choices and the actual managerial space that actualizes these choices. Though spending on intangibles and more particularly on R&D contribute substantially to growth parameters but the ambiguous magnitude of spending patterns and treatment of such expenditure from regular business operation to an investment element, in particular, to enhance the valued capability, yet unresolved in the corporate world. Recent studies on the usefulness of intangibleoutlay and capitalization of the same in improving future returns evidenced a gloomy pattern of crisis in the measurement and allocation of intangibles. As evidenced, most of the spending on intangibles by the business units in India is targeted to secure "patent for profit" rather than to achieve "valued capability" to expand real opportunities to choose between alternatives. Based on the last ten years' dataset of Maharatna Enterprises this study critically examines the contribution of decisive one from the container of four inputs namely spending on software, other R&D expenditure, materials, and employee costs on a set of productive activities covering the revenue and net- value-added, as these are more regular in enhancing both profit and production capability with the help of input-oriented VRS weighted measure-specific DEA model. Results show that the multidimensional performances between the enterprises are not uniform throughout the study period and that the efficiency is highly correlated with the size of a few companies like ONGC, BHEL, and GALE and higher spending DMUs on intangibles do not necessarily have higher-ranked performance in terms of returns and net value added. This study provides valuable insights for managers aiming to maximize the benefit of variety in Software and other R&D spending patterns considering the sizes of the companies while minimizing the risk associated with excessive diversity beyond the moderate threshold in intangible investments.

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1. INTRODUCTION

The diversity dimensions of spending on intangibles and its effects on corporate performance have been widely deliberated in recent years in the accounting domain and the outcomes highlighted varied trends (Areti & Kostas, 2017); (Ferdaous & Marian, 2020). Despite the wide-ranging patterns of different intangible outlay measures resulting in different rankings of the firms (Jun-You, 2014); (Negin & Jafar, 2018); and the importance of overcoming the distrust and suspicion towards diversified intangible spending in business should not be under estimated (Wang, 2007); (Tuan & Nguyen, 2022). Some degree of diversification of R&D expenditure as an instrument to survive the fierce competition seems to be a plausible one and the academic community will continue to work in this field to copy some of the key features of that business unit. Following historical results (Jeongjin & Juneseuk, 2017); (Marios & Palitha, 2020); with a systematic method of transforming a technology opportunity into an R&D plan (Chinho & Cheng-Yu, 2012), it is found that there exists a positive relationship between a business's R&D expenditure and its financial performance (Hyoungsuk & Hyungjun, 2020). Once a company heavily invests in intangibles to create a new product or service, it enjoys a higher return if the innovation can be marketed on a larger scale (Pegah & Peter, 2018); (Tang & Jianping, 2021).

Intangible resources are important drivers of firm success and both tangible and intangible resources have been suggested to have a positive linear effect on firm performance when studied independently (Vivien E, 2021). Both internally generated and externally acquired intangibles can drive positive results if diversified strategically (Mohammad & Nour, 2022). In recent years, due to the mismeasurement of intangibles productivity growth of many enterprises has declined but intangible assets' value and mark-up have risen (Nicolas & Janice, 2021). Spending on intangibles activity has similar effects on the performance of small and large-scale firms and size alone does not emerge as a prime determinant of R&D effectiveness (Robert & Mark, 1990). There is evidence from Indian enterprises relating to financial development and R&D expenditure (Danish & Rissmsha, 2012) ; import of technology, enterprise size, and R&D-based production wherein it is found that when controlled for size, the association between enterprises' R&D intensity and their products share a significant among technology importers, but not among no importers (Homi, 1994). It is found that earnings are higher in intangible-intensive firms compared to non-intangible-intensive firms (Pooja & Chandra Sekhar, 2020). Few studies argued that a firm's size or industry does not have a remarkable effect on the firm's innovation capability (Angel, 1994); (Minna & Ukko, 2014). The intensity of R&D spending for a sample of 291 Indian manufacturing firms suggests that the probability of undertaking R&D increases with the firm size only up to a certain level, while R&D intensity increases linearly (Nagesh & Mohammed, 1996).

Accounting treatment of intangibles in general (Tatiana & Raluca, 2016); and Research & Development (R&D) expenditure recognition in particular (Daniel & Anis, 2011), has been treated as an important determinant of economic growth (Uddin, 2019); (Haiping, 2022). To maximize the potential effect of R&D investment on economic growth and development, it is indispensable to ensure the efficiency and productivity of such investment. Several studies have found that strong corporate governance at both the firm level and country level helps to improve the efficiency and productivity of R&D investment. (Huimin Cui, 2002), (Chen, 2009), (Ayyagari, 2011); and (Florence Honore, 2015) argued that firm-level corporate governance assists to expand the efficiency of R&D investment. The issue of governance and R&D spending is touched on by many scholars such as (David Hillier, 2011); (Chu, 2016); (Steve & Thomas, 2020), who concluded that country-level governance has a significant effect on the efficiency of R&D investment. From a holistic point of view, both firm and country-level governance are important for the productivity and efficiency of R&D investment (Eric & Fraderic, 2020).

As intangible spending is driven by a host of firm-specific factors such as size, profit, and employee-related variables, Ratna status, and the ideology of the state where the enterprise operates (Ritika, 2021); and hence it is hard to believe how intangible spending is designed, diversified and promoted for so long in public sector enterprises without paying sufficient attention to this fundamental insight. The future trajectory of development depends on R&D investment and it is growing faster in emerging economies in recent years (Jiatao Li, 2009). The global R&D landscape is changing very rapidly and emerging markets are attracting more attention from multinational companies (MNCs) as a location for improving levels of R&D investment due to higher demand, lower cost, and increased levels of technology adoption. (Logue, 2011). As a result, in recent years, MNCs are establishing large numbers of R&D centers in emerging markets (Krishna, 2015). Although much of the attention is now on emerging markets, the fact remains that these countries are poor in terms of corporate governance practices. (Yurtoglu, 2013) pointed out that corporate governance practice is particularly poor in many emerging markets. More importantly, the possibility of managerial expropriation is higher in those economies due to the weak enforcement of legal rights and disclosure can be considered as a solution to the negative consequences of non-recognition of R&D spending in financial statements.Therefore, in the light of the complexity and eventually unlikeliness of successful comprehensive diversification of intangible spending, not only in public sector enterprises, the importance of Maharatna enterprises cannot be underestimated, both in terms of bestpractices and size factor for academicians and policymakers to learn from. It would be interesting to see whether firm-level Software and other R&D spending patterns considering the sizes of the companies and the risk associated with excessive diversity in intangible investments succeeded in a challenging environment thatis highly topical.

Using the eligibility criteria for each dimension as a framework of includes, this study summarizes the results of critical appraisal of the assessed literature that are more relevant for the big-picture questions and to answer them. Based on outcome measures, research findings across studies are structured and documented to get a fresh perspective on the issues. Many developing countries have innovation systems in an emerging stage and their ability of knowledge to support the creation of economically useful resources is still limited (Sutz, 2000). Hence, most firms do not have sufficient capabilities to perform intangible investment activities and technological change largely occurs through imports of capital goods (Vivarelli, 2014). In such type of developing countries, the instruments of innovation policy that encourage firms to invest more in intangible activities by lowering the costs of innovation are not expected to be very effective (Chaminade, 2017). Therefore, in this context, innovation policy should not focus primarily on R&D but the strengthening of managerial and technological capabilities, and voluntary disclosure practices so the firms can overcome major technological lags (Helen & Sidney, 2011). As (Maloney, 2017) argued that intangible outlay practices are the fundamentals for the development of more sophisticated innovation projects that include the invention of new technologies. The study of investment in intellectual capital by banks in improving productivity found that some components of intangibles improve productivity, and others do not (Godfred & Pattanayak, 2019).

The development of technological capabilities not only allows firms to choose and use technologies but also to get involved in R&D activities (Wu, 2010) as they refer to the capacity to gain an overview of the technologies in the market, assess their value, select the one required, use it, adapt it and finally develop new ones (Figueiredo, 1995). As a result, many developing countries implement innovation support programs to enhance firms' technological capabilities and this is done by providing training to the workers, assisting with management, replacing machinery and equipment, and by promoting exports and commercial partnerships (Aggelos & Dimitrios, 2022). Consequently, these programs are intended to promote behavioral changes by incentivizing cooperation and by improving the capabilities that are related to the innovation process. In the case of the Ecuadorian innovation support programs, there is evidence indicating that they have positive effects on firms' R&D intensity (Babkin, 2015) in Ecuador, some firms receive public procurement, which may also have an impact on their decision to invest in R&D activities as it represents a positive demand shock.

The relationship between firm size and innovative activity is analyzed and it is found that there are marked differences across industries in the functional relationship (Klaus, 1991). Innovation support programs enhance firms' technological capabilities and promote collaboration with other agents of the innovation system. By contrast, public procurement, in essence, encourages firms to invest in innovation activities by enlarging the size of the market (Uyarra E., 2013). Nonetheless, public procurement may also serve to foster firms' technological capabilities and promote partnerships if the public organizations demand products or services that do not exist in the market, but which could be developed by the contracting firms (Edquist, 2000) and (Georghiou L. E., 2014). When this is the case, the public sector not only uses procurement to get the goods and services necessary to perform its functions but to directly influence private firms' innovation activities (OECD., 2011). As previously indicated, this form of public procurement is known as "innovative public procurement" (Georghiou L. E., 2014) which may enhance firms' technological capabilities because the public organizations can act as a source of information relevant for the innovation activities of the firms (Guerzoni M., 2010). If this is to occur, prompt interaction between users (the public organizations) and producers (the firms) is vital (Guerzoni M., 2010).

The effects of country-level investor safeguards, reporting, and measurement mechanism on the relationship between R&D and firm performance is studied and it is found that safeguarding is relatively more important for the relationship between R&D and firm performance than other country-level governance mechanisms (Ashraful & Theophilus, 2020). The study (Socea, 2012) observed the role of financial data in decision-making by corporate executives and observed that financial information had significant effects on management in helping them to know the past and current conditions of their businesses, by providing a summary of their company's capacity, and preparing their future jobs and decisions, and more. Few studies on R&D efficiency evaluation found that serious imbalance exists in the R&D resources and there is a decline in the average overall efficiencies in the recent decade (Hui-hui & Yao-yao, 2020). It is found that the regional context has not only a direct effect on a firm's performance (Mario & Constantine, 2018), but it also conditions the returns to the firm's networking activities, although differences in the case of cooperation and outsourcing. Cooperating in innovation activities is more beneficial for those firms located in a knowledge-intensive region, whereas R&D outsourcing seems to be more profitable for firms in regions with a low knowledge pool (Damian, 2019). Previous findings in this field examine the relationship between R&D expenditures and future performance, as well as the moderating effects of ultimate ownership on the relationship, and opined that with concentrated ownership could attain higher future performance on R&D investments if there are more patent applications and capital and operating spending (Wang & Changhong, 2017). The study by (Malichova, 215) assessed the financial performance of companies operating in the IT sector using the provision of financial indicators such as return on assets, return on equity, and return on sales, and so on and suggested the identification of key factors to achieve maximum performance by continuing to find their changes in financial performance in the IT sector. A study (David & Hailin, 2019) analyzed the innovation incentives of firms in a model in which a firm's R&D investment is endogenous to performance comparisons due to performance feedback from historical and social comparisons and found that compared with non-family firms, the negative impact of inconsistent negative feedback on R&D investment is stronger in family firms. It is found that firms with high R&D intensity do not necessarily outperform those with low R&D intensity and more specifically, R&D exerts a positive influence on firm performance when it is below the estimated threshold value, whereas the impact becomes insignificant or even negative when it exceeds the estimated thresholds (Yiqi & Oyakhilome, 2019).

More importantly and more interestingly, it is found that optimal R&D decision configurations for financial performance depend on firm size, and managers in small-sized firms are advised to pay particular attention to a more functionally-structured R&D approach in configurations of strategic choices (Peter, 2017). In research and development decisions in the R&D investment model when analyzing firms' engagement in research as compared to development activities, it predicts higher spending in both activities for larger firms, but it also found that research intensity decline with firm size (Annette & Anwesha, 2022). It is found that agency costs experience a maximum value in the case of firm size and R&D activity and, therefore, agency costs are lower at both low and high levels of firm size and R&D activity (Giorgio & Stephen, 2022). This study aligns with the literature trying to analyze the role of the firm size and different determinants of intangible spending on performance using firm-level data.

2. RESEARCH METHOD

Using the four input variables namely material consumption, employee expenditure, spending on software, and spending on other R&D of the business unit, the best practice status based on efficiency score is evaluated to see whether a change in the value of a decisive factor significantly affects the performance grade between the units under study and accordingly the units are categorized to detect the key variable and then assessed the score taking the size of the DMUs as intervening variable from the published last ten years data of the respective unit. The VRS measure-specific models for a particular inefficient DMU_d,

$\theta_d^{k*} = \min \theta_d^k \quad d \in N$

Subject to

$\sum_{j \in E} \lambda_j^d x_{kj} = \theta_d^k x_{kd} \quad k \in \{1, \ldots, m\}$ (1)

$\sum_{j \in E} \lambda_j^d x_{ij} \leq x_{id} \quad i \neq k$

$\sum_{j \in E} \lambda_j^d y_{rj} \geq y_{rd} \quad r = 1, \ldots, s \quad \sum_{j \in E} \lambda_j^d = 1$

$\lambda_j^d \geq 0, j \in E,$

Where E indicates the index sets for the efficient and inefficient companies respectively and is identified by the VRS envelopment DEA model. It determines the maximum potential decrease of input while keeping other inputs at the current level. We define weighted measure specific scores within each company by considering the sizes of the companies with the net worth as a proxy of the size. We define kth input-specific benchmark-share for each efficient DMU_j, $j \in E$,

$\lambda_j^k = \{\sum_{d \in N} \lambda_j^{d*} (1 - \theta_d^{k*}) x_{kd}\} / \{(1 - \theta_d^{k*}) x_{kd}\}$

Where λ_j^{d*} and θ_d^{k*} are optimal values in (1) above.

3. RESULT AND ANALYSIS

As the drive is to identify the contribution of operating expenditure, spending on software, and other R&D investments to the performance grade, we selected a bundle of two variables namely revenueand net-value-added as the DEA outputs. A weighted measure specific VRS oriented efficiency scores of the operating unit depicts that only 11 percent of the total units are running at the best practice level and that efficiency may be highly correlated with size in these DMUs, otherwise there is no uniformity in the performance grades between the decision-making units under study. The results of the input-oriented VRS efficiency scores for NTPC exhibit that at least fifty percent of sceneries software and spending on R&D are the decisive value drivers. It appears that when other than R&D and software spending applied for each input measure at a time the input individually did not influence the efficiency classification of the unit because the possible inefficiency existed in each associated input when other inputs are fixed at their current level. It appears that when R&D and Software are applied for each input measure at a time, the R&D and Software expenditure input independently attained the efficiency classification in the last year of ONGC but the size-specific comparative efficiency score is optimal at the beginning and the fifth year of the study period. SAIL which is an inefficient unit, the optimal values are far from the best-practice frontiers, and it points out that spending on intangibles is not the decisive determinant in achieving the performance frontier. BHEL has the optimal solutions when the sizes of the unitsare considered to characterize the efficiency. Similarly, IOC depicts an optimal solution during the last two years of the study period but when the size measure is in to consideration it attained the optimal score in the initial year of the study period. CI is efficient under the envelopment model in almost all the years during the study period but size-specific scores yield different efficient targets so the unit cannot be considered as efficient because a DMU is efficient under envelopment models if and only if it is efficient under measure-specific models i.e., both the measure-specific models and the envelopment models yield the same frontier. GAIL with an untenable average score of 0.26528 indicates possible inefficiency exists in each associated input when other inputs are prearranged, the VRS scores are scattered throughout the study period. When R&D and Software spendingis exclusively applied for BPC it reaches the optimal solutions with a best-practice score during the first half of the study period. However, when the sizes of the units are specifically considered the model yielded different efficient targets indicating the possible inefficiency of the DMUs.

TABLE 1: EFFICIENCY SCORES OF MAHARATNA ENTERPRISES

DMUs	Overall	R&D	Software	OT R&D	OT Software	Weighted M-S Score
NTPC 1	0.17444	0.06985	0.05362	0.13939	0.17437	0.03192
NTPC 2	0.30424	0.15418	0.10237	0.23486	0.27083	0.02611
NTPC 3	0.34580	0.15016	0.09639	0.27335	0.30963	0.02154
NTPC 4	1.00000	1.00000	1.00000	1.00000	1.00000	0.02268
NTPC 5	0.89873	0.76131	0.32905	0.86546	0.88595	0.01981
NTPC 6	1.00000	1.00000	1.00000	1.00000	1.00000	0.01748
NTPC 7	1.00000	1.00000	1.00000	1.00000	1.00000	0.01719
NTPC 8	1.00000	1.00000	1.00000	1.00000	1.00000	0.01731
NTPC 9	0.96079	0.85827	0.58901	0.94791	0.95694	0.01553
NTPC 10	1.00000	1.00000	1.00000	1.00000	1.00000	0.01304
ONGC1	0.49600	0.02238	0.01634	0.46129	0.49600	1.00000
ONGC 2	0.60418	0.11278	0.09016	0.60243	0.60405	0.71156
ONGC 3	0.82782	0.82782	0.05043	0.67191	0.82782	0.86831

ONGC 4	0.82455	0.73964	0.05850	0.78951	0.82455	0.67977
ONGC 5	0.81673	0.69718	0.05563	0.80305	0.81673	1.00000
ONGC 6	0.78980	0.76825	0.08523	0.75793	0.78980	0.69581
ONGC 7	0.75375	0.73514	0.05114	0.68697	0.75375	0.48515
ONGC 8	0.99218	0.94961	0.94899	0.99075	0.99077	0.40444
ONGC 9	0.77726	0.59479	0.02089	0.75688	0.77726	0.42032
ONGC 10	1.00000	1.00000	1.00000	1.00000	1.00000	0.32913
SAI1	0.20234	0.09793	0.09793	0.01205	0.03252	0.03490
SAI 2	0.16859	0.09241	0.09241	0.01159	0.03042	0.02629
SAI3	0.21007	0.15209	0.15209	0.01387	0.03272	0.02131
SAI4	0.11645	0.08110	0.08110	0.01373	0.02467	0.02090
SAI5	0.14117	0.11519	0.11519	0.01285	0.04196	0.02167
SAI6	0.07623	0.05427	0.05427	0.00221	0.04166	0.02150
SAI7	0.06416	0.03328	0.03112	0.00000	0.04183	0.01684
SAI8	0.06233	0.02758	0.02496	0.00000	0.04371	0.01770
SAI0	0.04930	0.01422	0.01200	0.00000	0.04062	0.01390
SAI10	0.06034	0.01749	0.01473	0.00000	0.05042	0.01212
BHE1	0.06676	0.02388	0.02388	0.01694	0.02899	1.00000
BHE2	0.14853	0.07247	0.07247	0.01974	0.02938	1.00000
BHE3	0.08648	0.04304	0.03913	0.02008	0.03574	0.99376
BHE4	0.04456	0.01855	0.01855	0.01868	0.02696	0.90298
BHE5	0.04147	0.01726	0.01453	0.01866	0.03582	1.00000
BHE6	0.05587	0.02685	0.02278	0.01441	0.04851	1.00000
BHE7	0.07422	0.03314	0.02851	0.00579	0.06409	0.98602
BHE8	0.10950	0.06314	0.05781	0.00289	0.07025	0.86927
BHE9	0.07548	0.03926	0.03392	0.00015	0.06219	0.61880
BHE10	0.05970	0.03305	0.02711	0.00157	0.05307	0.66104
IOC 1	0.32273	0.09020	0.08041	0.08428	0.31445	1.00000
IOC2	0.36866	0.16448	0.14153	0.14433	0.33753	0.86293
IOC3	0.51875	0.33961	0.31190	0.31435	0.40948	0.73676
IOC4	0.42431	0.18194	0.15994	0.27131	0.41872	0.61510
IOC5	0.32523	0.11645	0.10851	0.10848	0.28242	0.47617
IOC6	0.22734	0.04411	0.04411	0.01362	0.19938	0.48690
IOC7	0.13142	0.03189	0.02818	0.00408	0.11787	0.52721
IOC8	1.00000	1.00000	1.00000	0.00000	1.00000	0.47671
IOC9	1.00000	1.00000	1.00000	0.00000	1.00000	0.36332
IOC10	0.22801	0.04200	0.04200	0.03981	0.20706	0.25422
CI 1	0.97447	0.89949	0.77535	0.96719	0.97215	0.02277
CI 2	1.00000	1.00000	1.00000	1.00000	1.00000	0.01877
CI 3	0.84912	0.60653	0.46775	0.78345	0.83171	0.01734
CI 4	1.00000	1.00000	1.00000	1.00000	1.00000	0.01767
CI 5	1.00000	1.00000	1.00000	1.00000	1.00000	0.01701
CI 6	0.87924	0.54980	0.31960	0.84860	0.87924	0.01774
CI 7	1.00000	1.00000	1.00000	1.00000	1.00000	0.01671

CI 8	1.00000	1.00000	1.00000	1.00000	1.00000	0.01797
CI 9	1.00000	1.00000	1.00000	1.00000	1.00000	0.01927
CI 10	1.00000	1.00000	1.00000	1.00000	1.00000	0.01843
GAI1	0.07833	0.00990	0.00772	0.00000	0.07833	0.00803
GAI 2	0.09133	0.00958	0.00743	0.00000	0.09133	0.04427
GAI 3	0.10213	0.02758	0.02392	0.00000	0.10212	0.00440
GAI 4	0.10506	0.01992	0.01652	0.00000	0.10506	0.00628
GAI 5	0.09008	0.02147	0.01818	0.00000	0.08729	0.03885
GAI 6	0.72465	0.72465	0.56681	0.51615	0.68368	0.21087
GAI 7	0.09951	0.01959	0.01630	0.00000	0.09896	0.70197
GAI 8	0.17310	0.01539	0.01199	0.02684	0.15937	1.00000
GAI 9	0.18860	0.07883	0.06864	0.00000	0.15770	1.00000
GAI 10	1.00000	1.00000	1.00000	1.00000	1.00000	0.19431
BPC 1	0.99974	0.99665	0.99665	0.99971	0.99971	0.02824
BPC 2	1.00000	1.00000	1.00000	1.00000	1.00000	0.04452
BPC 3	1.00000	1.00000	1.00000	1.00000	1.00000	0.02764
BPC 4	1.00000	1.00000	1.00000	1.00000	1.00000	0.02254
BPC 5	1.00000	1.00000	1.00000	1.00000	1.00000	0.02327
BPC 6	1.00000	1.00000	1.00000	1.00000	1.00000	0.11249
BPC 7	0.85868	0.84373	0.73583	0.60675	0.84369	0.62786
BPC 8	0.73291	0.70874	0.61845	0.64096	0.70690	0.79951
BPC 9	0.74396	0.72190	0.49627	0.51712	0.73776	0.69690
BPC 10	0.85149	0.82629	0.40478	0.60611	0.85149	0.01597

From the above table, it is evident that the multidimensional sustainable intangible spending and financial performances between the enterprises are not uniform throughout the study period. Many units are efficient under the envelopment model in almost all the years during the study period but size-specific scores yield different efficient targets so the unit cannot be considered as efficient because a DMU is efficient under envelopment models if and only if it is efficient under measure-specific models i.e., both the measure-specific models and the envelopment models yield the same frontier. It is interesting to note that larger firms with high intangible outlay do not necessarily outperform those with small sizes and lowintangible spending intensity. Results show that the multidimensional financial performances between the enterprises are not uniform throughout the study period and that the efficiency is highly correlated with the size of a few companies like ONGC, BHEL, and GALE and higher spending DMUs on intangibles do not necessarily have higher-ranked performance in terms of returns and net value added.

4. CONCLUSION

A wide ranging apprehensions of R&D spending in PSEs will increase the revenue and would make make the sector more competitive is not always factual but given the magnitude of the outcomes, the possibility of effective retun of intangibles beyond optimum level is virtually non-existent. Results show that the multidimensional performances between the enterprises are not uniform throughout the study period and that the efficiency is highly correlated with the size of a number of companies and higher spending DMUs on intangibles do not necessarily have higher-ranked performance in terms of returns and net value added. This study provides valuable insights for managers aiming to maximize the benefit of variety in Software and other R&D spending patterns considering the sizes of the companies while minimizing the risk associated with excessive diversity beyond the moderate threshold in intangible investments.The study is solely based on secondary data and it would have been different had it been able to incorporate the existing practices of their intangible spending decisions. The study has a scope to further research to extend the present research area by extending the sample size by incorporating Navaratna and Miniratna companies of the public sector enterprises. Studies can be made in this research area with a more extended study period. A comparative study can also be made with the tenure of the companies.

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