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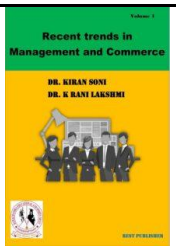

Multi-criteria Assessment of Inter-company Comparison using WASPAS Method

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Abstract

Adequate comparative performance of competing firms for quantitative evaluation and ranking several financial ratios must be considered simultaneously. This article is inter-institutional Examines the comparative process, A multi-criteria analysis model creates; The WASPAS approach identifies "For assessment purposes" Relevance of financial ratios in every financial ratio Inter-organizational Performance differences can be addressed. Through the interdependence of this assessment result is not conclusive ensures that Ratios, objective weights are used; consequently, the comparative process Conducted on a generally accepted basis and does not depend on the subjective preferences of various stakeholders. Inter-organizational In the comparative problem approach, Funding rates used the results reflect the information result shows that Comparison of objective weighting methods to other methods compares favorably with the WASPAS approach. Compare five firms (A1, A2, A3, A4, and A5) in the textile industry. A case study took this alternative approach and evaluated profitability, productivity, market position and debt ratio. A1 in 1st rank, A4 in 2nd rank, A5 in 3rd rank, A2 is at 4th rank and A3 is at 5th rank.

Introduction

Generally the company's performance over its financial statements, ie balance sheet, income statement and abridged from Trade Account Period reflected by various financial ratios. Provide information of the company from various angles Reflect on performance. For a particular company, these rates are always does not develop in the same direction, and progress at a rate another ratio Only at the expense of collapse can be achieved. Without considering all these conflicting ratios simultaneously, of competing firms evaluate overall performance meaningfully or cannot be ranked. Van der Wijst (1990) Inter-firm in small business described the method of comparison, this is ratio analysis basically no, Instead it uses less restrictive models. This method is common; Rate based Inter comparison method it aims to overcome many shortcomings. Of Income Statement and Balance Sheet For all major items Specimens are mentioned. The specification is based on financial and other theories, but in small business it is also based on practical experience. Together, these models are comprehensive of small business performance and implemented a comprehensive assessment. Explain and predict the behavior of an organization various techniques are widely used. However, in practice, companies and comparative evaluation of ranks in general A single measure of corporate success based on Nevertheless, the definition of action is more appropriate has given rise to considerable debate. As indices of the overall performance of the company, some common financial ratios to indicate how appropriate, Greek Pharmaceutical Industry used in a larger sample Multivariate analysis used the results. And to differentiate the companies, Profitability in ranking is very representative the results show that action. Labor productivity and market share business the best indicators of success; Business failure can mean long term and short term debt Very closely related to rates.

Inter-company comparison

Comparisons between firms are generally should be on an accepted basis conducted. With many problems in a particular context, through a subjective weighting process Relative Importance of Financial Ratios Achieving an agreement on Includes stakeholders or difficult for DMs of various interests. This difficulty increases when suitable TMs are not available. In addition, the financial ratios used are absolute are not independent, because they are all connected are affected to some extent by the performance of the company. Depends on various subjective preferences TMs By using the objective weighting process carried out these problems can be overcome. This is especially true when Reliable subjective weights can't get Of alternatives given by each criterion The average generated by the ensemble is measured by intrinsic information Objective weights of criterion importance, Conflicting criteria and reflect the interdependent nature of the criteria Enables integration. Inter-organizational In the use of comparison, Objective weights of financial ratios Depending on each financial ratio, companies' performance is determined by varying severity of ratings. In other words, a contextual sense of informational importance based on Sent to DM To represent average internal information, About financial ratios Shannon's concept of entropy Best suited for measuring relative contrast intensity. Each fund has a ratio Entropy measurement the result clearly indicates the amount of information. A company's performance over a period of time generally summarized from its financial statements Reflected by various financial ratios. These rates are for shareholders of the company Provide useful information.

Of the company from various angles Reflect on performance. For a given company, these rates are always does not move in the same direction and progress at a rate It can only be achieved if the other ratio deteriorates. All these conflicting rates without simultaneous consideration of competing firm's accurate overall performance cannot be rated or ranked. Compare five companies (A1, A2, A3, A4, and A5) in the textile industry in Surat, India. Four financial ratios for industry (Profitability, productivity, market position and debt ratio) were identified as evaluation criteria. Using available financial data of these companies, Performance evaluation of each company each fund is calculated based on the ratio. Estimates of the loan-to-value ratio, taken as the inverse of the original, like any other measures are considered a measure of goodness.

WASPAS method

Two well-known applications of the WASPAS method MCDM is a unique combination of approaches, namely WSM and WPM. Basically A common criterion is sought. The first criterion of optimality, ie similar to WSM method the tie average success criteria. It is a popular and well-accepted MCDM approach; it is used to evaluate multiple alternatives based on multiple decision criteria. WASPAS method, The MCDM method of Zavatskas et al Proposed and improved. This method was used and extended to many decision problems and contexts. Better construction for a deep sea port to select a site Based on the WASPAS method An integrated multi-criteria decision-making model was presented. iožinytė and Antuchevičienė using AHP, COPRAS, TOPSIS and WASPAS methods Daylighting in a renovated local building and developed the MCDM approach to deal with the classical continuity problem. Using SWARA (Hierarchical Weighted Ratio Analysis) and WASPAS methods to solve shopping mall location problem several criteria formed a decision-making approach. WASPAS and MOORA methods were tested to verify strength. Some public and commercial buildings To assess facades WASPAS method was used. COPRAS, WASPAS and TOPSIS methods Use of modernization Eco-Economic Assessment of several residential houses was applied. Based on the WASPAS system An MCDM approach is feasible Select and rank wind farm locations in the Baltic Sea region it is also proposed to evaluate the types of wind turbines. Based on SWARA and WASPAS methods Structural health monitoring of bridges To evaluate real-time intelligent sensors Several criteria formed a decision-making approach. Interval value intuition Extended with fuzzy numbers WASPAS proposed the system And its conclusion is already there compared with some methods. Cutting fluid using the Chakraborty and Javadskas Vaspass method, they solve various manufacturing problems like Electroplating system, forging stage, arc welding process etc. Based on QSPM and WASPAS They developed the MCDM approach. Methods for Determining Outsourcing Strategies. For implementation of solar projects To assess the priority of regions SWARA and WASPAS methods were used. Low energy home energy WASPAS method in distribution system A multi-criteria evaluation was used. The findings of this research indicate that among MCDM techniques with greater precision in the qualitative analysis of risks introduced a new MCDM technique. To identify and analyze these research risks Consistent with other research efforts. In the RM process Although other decision-making methods are used, WASPAS method is not used in this section, this time in real condition the results show that there is a consistency. Of course, this study is on project objectives Limited to reviewing all risk outcomes. Negative of these research goals only reviewed risk outcomes, It is a positive risk in future project objectives and may be extended by assessing opportunities.

TABLE 1. Set of data for Inter-company comparison

	Profitability	Productivity	Market position	Debt ratio
A1	77.42	54.12	85.43	29.13
A2	52.13	45.31	72.43	33.43
A3	24.13	58.73	69.43	29.43
A4	65.13	64.13	66.43	24.13
A5	42.13	76.31	82.43	27.45

Table 1 shows the set of data of profitability, productivity, market position, debt ratio of A1, A2, A3, A4, A5 to calculate the final value.

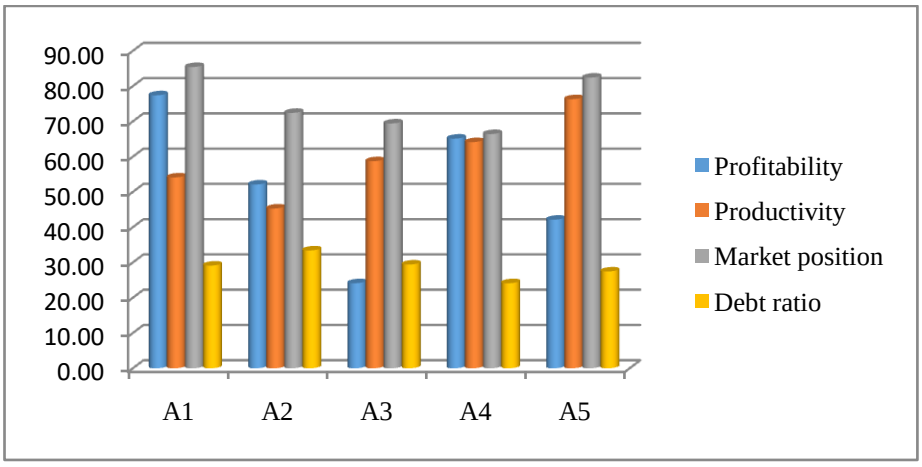

FIGURE 1. Data set for Inter-company comparison

Figure 1 shows a pictorial representation of the data set of E profit, productivity and market position, debt ratio of A1, A2, A3, A4 and A5 to calculate the final value.

TABLE 2. Performance value

	Profitability	Productivity	Market position	Debt ratio
A1	1.00000	0.70921	1.00000	0.82836
A2	0.67334	0.59376	0.84783	0.72181
A3	0.31168	0.76962	0.81271	0.81991
A4	0.84126	0.84039	0.77760	1.00000
A5	0.54417	1.00000	0.96488	0.87905

Table 2 shows the performance value of the inter-organizational comparison using the WASPAS method, which is calculated by the value in the dataset divided by the maximum value of a given value in the dataset.

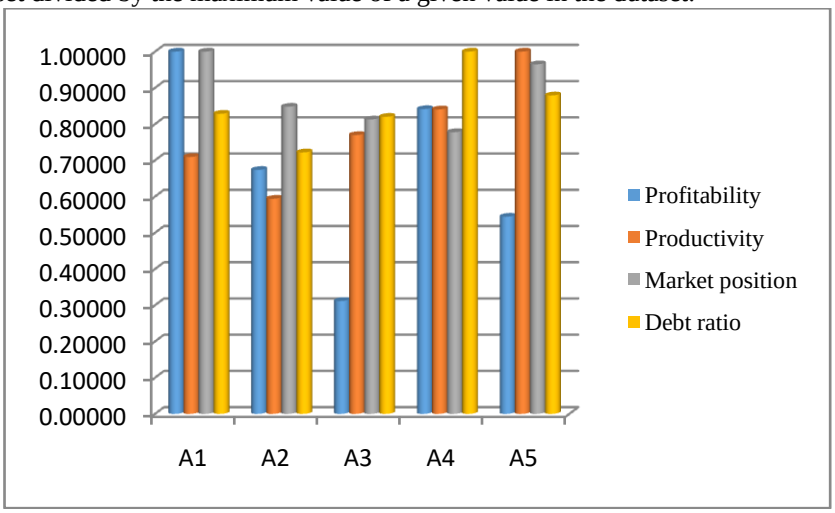

FIGURE 2. Performance value

Figure 2 shows the performance of an inter-organizational comparison of programs using the WASPASS method, calculated by the value in the dataset.

TABLE 3. Weight

	Profitability	Productivity	Market position	Debt ratio
A1	0.25	0.25	0.25	0.25
A2	0.25	0.25	0.25	0.25
A3	0.25	0.25	0.25	0.25
A4	0.25	0.25	0.25	0.25
A5	0.25	0.25	0.25	0.25

Table 3 shows the weights of the data set, where the weight is equal to all values in the data set in Table 1. The weight is multiplied with the previous table to get the next value.

TABLE 4. Weighted normalized decision matrix

	Profitability	Productivity	Market position	Debt ratio
A1	0.25000	0.17730	0.25000	0.20709
A2	0.16834	0.14844	0.21196	0.18045
A3	0.07792	0.19241	0.20318	0.20498
A4	0.21031	0.21010	0.19440	0.25000
A5	0.13604	0.25000	0.24122	0.21976

Table 4 shows the weighted normalization result matrix calculated by multiplying the weight and performance value in Table 2 and Table 3.

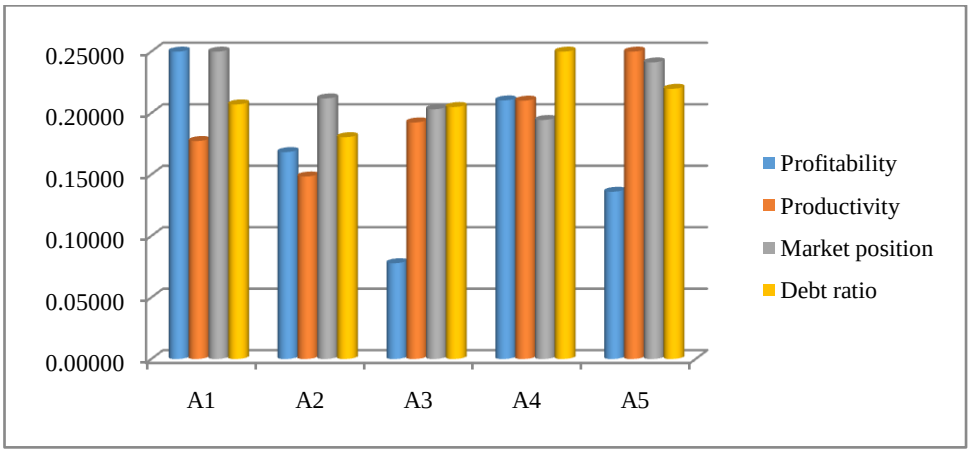

FIGURE 3. Weighted normalized result matrix

Figure 3 shows the weighted normalization result matrix calculated by multiplying the weight and performance value in Table 2 and Table 3.

TABLE 5. Weighted normalized decision matrix

	Profitability	Productivity	Market position	Debt ratio
A1	1.00000	0.91769	1.00000	0.95401
A2	0.90585	0.87782	0.95957	0.92173
A3	0.74718	0.93663	0.94948	0.95157
A4	0.95771	0.95746	0.93905	1.00000
A5	0.85888	1.00000	0.99110	0.96829

Table 4 shows the weighted normalization result matrix calculated by the power weight of the efficiency value in Table 2 and Table 3.

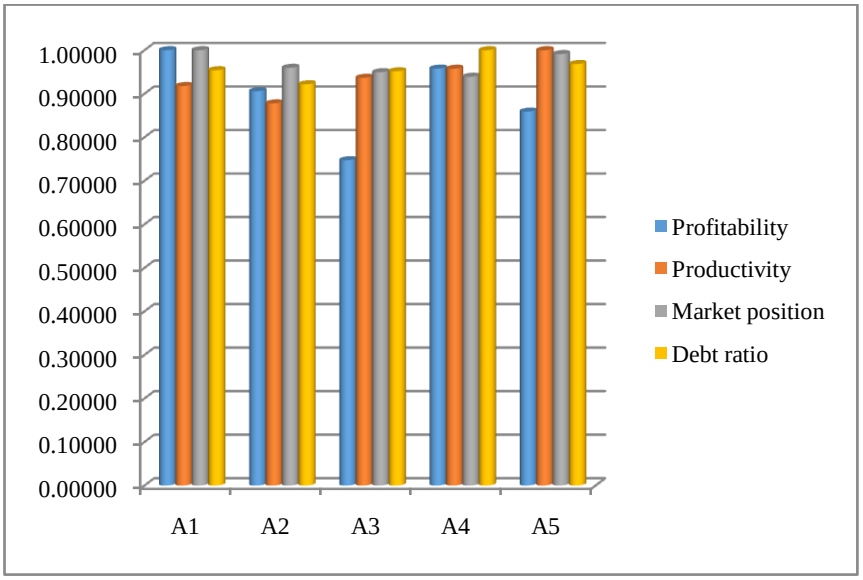

FIGURE 4. Weighted normalized result matrix

Figure 4 shows the weighted normalization result matrix calculated by the power of the performance value in Table 2 and Table 3.

TABLE 6.WSM Weighted sum Model value

A1	0.88439
A2	0.70918
A3	0.67848
A4	0.86481
A5	0.84703

TABLE 7. WPM Weighted Product Model value

A1	0.87548
A2	0.70331
A3	0.63230
A4	0.86107
A5	0.82425

Table 6 shows the preference score of the WSM weighted sum model, which is calculated by the sum of the value in the rows of weighted normalized result matrix. The priority score of the WPM weighted product model is calculated by multiplying the value in the row Weighted normalized result matrix.

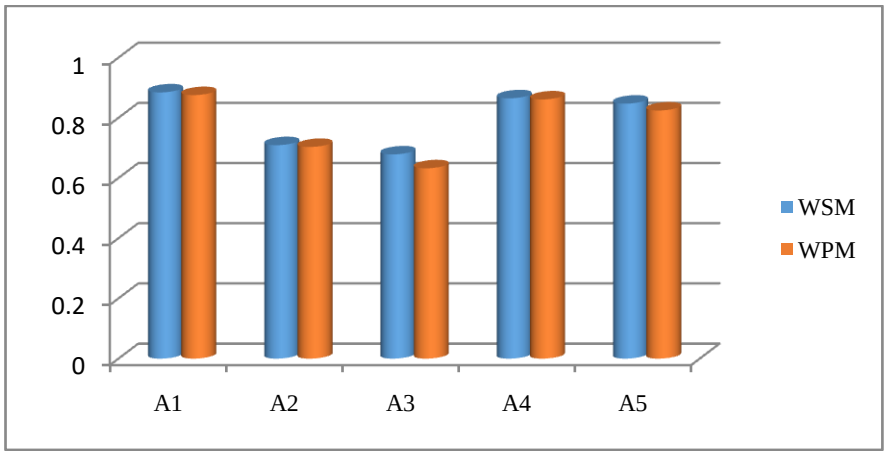

FIGURE 5.WSM and WPM

Figure 5 shows the preference score of the WSM weighted sum model, a weighted normalized result is calculated by summing the values in the rows of the matrix. WPM is a weighted priority score product model is calculated by multiplying the value in the row Weighted normalized result matrix Computation of WPM and WSM.

TABLE 8. Rank for Inter-company comparison using WASPAS

A1	0.87994	1
A2	0.70625	4
A3	0.65539	5
A4	0.86294	2
A5	0.83564	3

Table 9 shows the rank of the data set A4 is on 2^{nd} rank, A2 is on 4^{th} rank, A3 is on 5^{th} rank, A5 is on 3^{rd} rank and A1 is on 1^{st} rank. The WASPAS coefficient is calculated by multiplying the WPM and WSM by the lambda value (0.5). Later WPM and WSM will be added.

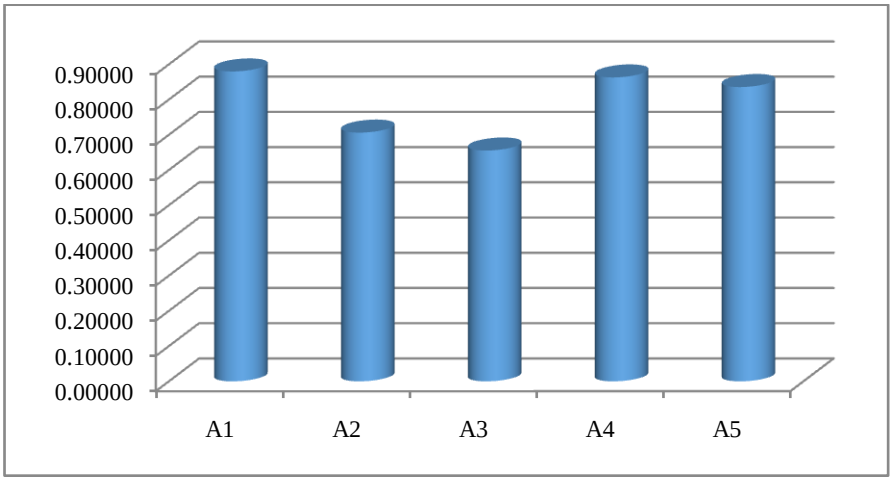

FIGURE 6. WASPAS Coefficient value

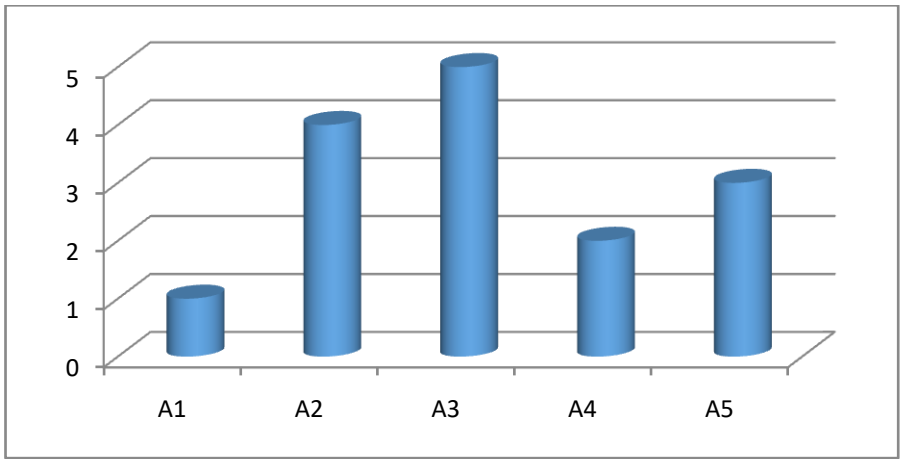

FIGURE 7. Rank for the data set Inter-company comparison

Figure 7 shows the rank of the Inter-company comparison data set; A4 is on 2nd rank, A2 is on 4th rank, A3 is on 5th rank, A5 is on 3rd rank and A1 is on 1st rank.

Conclusion

In this paper, the inter-organizational Comparison is useful a simple and straightforward way to solve the problem we presented the MCDM approach. Meaningful interpretation of comparative results WASPAS method is used to confirm. Relevance of financial ratios to outcome it can be identified, for each financial ratio represents the difference in performance between companies. To solve the problem of inter-criteria dependence, Objective weights for financial ratios are used. Evaluation result, of the company Accepted by various stakeholders, because it is their subjectivity and often of financial ratios independent of random preferences. This approach effectively replicates the decision information expressed through financial ratios and that it's meaningful rankings and can provide useful information a real in India An empirical study of the case demonstrates. This approach is computationally simple and its basic concept rationally intelligible, thus enabling it to be implemented in a computer based system. A1 ranks first and A2 ranks last in inter-company comparison.

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