FINANCIAL PERFORMANCE RANKING OF TRANSPORTATION COMPANIES IN MALAYSIA USING THE TOPSIS METHOD

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Abstract

This study aims to evaluate and rank the financial performance of transportation companies in Malaysia using the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), a widely accepted Multi-Criteria Decision-Making (MCDM) tool. The main objective is to rank the companies based on multiple financial indicators, including profitability, liquidity, efficiency, and leverage. Financial data were collected from annual reports and analyzed using TOPSIS to determine each firm's relative closeness to the ideal financial performance. The results reveal significant variations in performance across firms, where high return on assets and minimal debt levels drive top rankings. The findings deliver practical, data-based benchmarks *that aid investment decisions, policy formulation, and strategic planning in the transportation industry.*

INTRODUCTION

The transportation industry serves as a foundational pillar for Malaysia's economic development by enabling the efficient movement of goods and people, fostering trade connectivity, and enhancing national productivity (Hu et al., 2025). However, as the country becomes more interconnected with the global economy, the industry faces mounting pressures driven by globalization, technological evolution, and changing consumer demands. These dynamics require transportation firms to demonstrate both operational efficiency and financial resilience to remain competitive.

Recognizing this need, the present study aims to evaluate and rank the financial performance of selected Malaysian transportation companies using a multi-criteria approach. Specifically, it seeks to (i) identify key financial indicators relevant to the sector, (ii) apply the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) to assess and rank these companies, and (iii) analyze the results to highlight financial strengths and weaknesses.

LITERATURE REVIEW

Financial performance is a critical measure of an organization's ability to generate value for shareholders, maintain operational stability, and achieve long-term sustainability. In the transportation sector, financial performance is often evaluated using a combination of profitability, liquidity, leverage, and efficiency ratios, which provide a more complete picture of a company's financial health. Common indicators include return on assets (ROA), return on equity (ROE), net profit margin (NPM), current ratio, debt-to-equity ratio, and asset turnover ratio (Brealey et al., 2020.)

Previous studies have shown that relying on a single metric can lead to an incomplete evaluation. For example, (Seretidou et al., 2025) found that profitability ratios alone may not reflect a company's ability to meet short-term obligations, while liquidity ratios do not necessarily indicate operational efficiency. As a result, researchers have increasingly employed multidimensional approaches that combine several financial indicators to capture both short-term and long-term performance. In the transportation sector, studies such as Wanke et al. (2016) and Hussain et al. (2020) have used a range of financial ratios to benchmark performance, revealing significant variations in efficiency and profitability across companies.

Multi-Criteria Decision-Making (MCDM) methods are widely used to integrate multiple measures into a single assessment . Among these, TOPSIS is valued for ranking alternatives based on their proximity to the Positive Ideal Solution (PIS) and distance from the Negative Ideal Solution (NIS) (Almoghathawi et al., 2017; Balcı, 2017; Behzadian et al., 2012; Chen et al., 2019; Fahami et al., 2015; Feng & Wang, 2000; Ferreira et al., 2016; Hamdan et al., 2019; Hwang & Yoon, 1981; Jupri & Sarno, 2019; Raed, 2020; Shih et al., 2007; Wasara & Ganda, 2019)

It has been applied across industries including manufacturing, banking, and energy (Abd Rahim et al., 2020; Azhar et al., 2022; Deng et al., 2000; Hoe et al., 2018, 2019; Teker et al., 2022; Yildiz, 2020), but its application in Malaysia's transportation sector remains scarce. Addressing this gap, the present study combines comprehensive financial indicators with TOPSIS to provide robust, data-driven insights for the industry.

RESEARCH METHODOLOGY

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This study evaluates the financial performance of 25 transportation companies listed in Malaysia in 2024, using data obtained from DataStream (Table 1). The evaluation employed the TOPSIS method based on nine financial ratios representing different dimensions of performance. The Current Ratio was used to measure liquidity, while the Debt Ratio reflected leverage. Profitability was assessed through Gross Profit Margin, Operating Profit Margin, Return on Equity (ROE), and Earnings per Share (EPS). Market performance was captured using the Price-to-Earnings (P/E) Ratio and Dividend Yield. Among these indicators, Current Ratio, Dividend Yield, EPS, Gross Profit Margin, Operating Profit Margin, P/E Ratio, and ROE were considered benefit criteria to be maximized, whereas the Debt Ratio was treated as a cost criterion to be minimized. These ratios were chosen as they are commonly used in prior studies and provide a comprehensive view of liquidity, profitability, leverage, and market standing.

Table 1. Transportation companies in Malaysia stock market

Company Name	Company Code
MISC BHD	C1
WESTPORTS HOLD	C2
BINTULU PORT	C3
CHIN HIN GROUP	C4
GDEX BHD	C5
SHIN YANG GROUP BHD	C6
HARBOUR-LINK GROUP	C7
TASCO BHD	C8
SURIA CAPITAL HLDGS	C9
SWIFT HAULAGE BHD	C10
AVANGAAD BHD	C11
MAYBULK BHD	C12
FM GLOBAL	C13
TIONG NAM LOG HLDGS	C14
BOUSTEAD HEAVY	C15
POS MALAYSIA BHD	C16
TAS OFFSHORE	C17
CJ CENTURY LOGISTICS	C18
STRAITS ENERGY	C19
G CAPITAL BHD	C20
SEALINK INTERNAT	C21
SEE HUP CONSOL	C22
XIN HWA	C23
PERAK CORP BHD	C24
TRI-MODE SYSTEM	C25

Source: DataStream

The Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) is a multi-criteria decision-making method that ranks alternatives based on their distance from an ideal (best) and a negative (worst) solution. In this study, TOPSIS was applied in seven steps as detailed below.

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Step 1: Decision Matrix $\left(\left(x_{ij}\right)_{m \times n}\right)$ Formation.

To create a decision matrix, m alternatives (companies) and n criteria (financial ratios) are considered. Each alternative is assigned a score for each criterion x_{ij}, resulting in the construction of a matrix $\left(x_{ij}\right)_{m \times n}$ denoted as below.

$$(x_{ij})_{m \times n} = \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ . & & & . \\ . & & & . \\ . & & & . \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix} \tag{1}$$

Step 2: Decision Matrix Normalization.

The normalized decision matrix $R = (r_{ij})_{m \times n}$ is constructed by transforming the attribute dimensions into non-dimensional attributes, as illustrated below.

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^2}}, i = 1, 2, ..., m, j = 1, 2, ..., n \tag{2}$$

$$R = (r_{ij})_{m \times n} = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ . & & & . \\ . & & & . \\ . & & & . \\ r_{m1} & r_{m2} & \cdots & r_{mn} \end{bmatrix} \tag{3}$$

*Step 3: Weighted Normalized Decision Matrix (**T**) Construction.*

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$$T = (t_{ij})_{m \times n} = (w_j r_{ij})_{m \times n}, i = 1, 2, ..., m \quad \text{where} \quad w_j = \frac{W_j}{\sum\limits_{j=1}^{n} W_j}, j = 1, 2, ..., n$$

$$(4)$$

$\sum\limits_{j=1}^{n} w_j = 1$ and W_j is the original weight given to the indicator, $w_j, j = 1, 2, ..., n$

$$T = \begin{bmatrix} w_1 r_{11} & w_2 r_{12} & ... & w_n r_{1n} \\ w_1 r_{21} & w_2 r_{22} & ... & w_n r_{2n} \\ . & & & . \\ . & & & . \\ . & & & . \\ w_1 r_{m1} & w_2 r_{m2} & ... & w_n r_{mn} \end{bmatrix}$$

$$(5)$$

Step 4: The Positive/Best Ideal (A_b) *Solution and The Negative/Worst Ideal* (A_w) *Solution Determination.*

$$A_b = \{\langle \min(t_{ij} \mid i = 1, 2, ..., m) \mid j \in J_- \rangle,$$
$$\langle \max(t_{ij} \mid i = 1, 2, ..., m) \mid j \in J_+ \rangle\} \equiv \{t_{bj} \mid j = 1, 2, ..., n\},$$

$$(6)$$

$$A_w = \{\langle \max(t_{ij} \mid i = 1, 2, ..., m) \mid j \in J_- \rangle,$$
$$\langle \min(t_{ij} \mid i = 1, 2, ..., m) \mid j \in J_+ \rangle\} \equiv \{t_{wj} \mid j = 1, 2, ..., n\},$$

$$(7)$$

where,

$J_+ = \{j = 1, 2, ..., n \mid j$ associates with the criteria having a positive impact, and

$J_- = \{j = 1, 2, ..., n \mid j$ associates with the criteria having a negative impact.

Step 5: The Separation Measures for Each Alternative from the Best Ideal Solution and Negative Ideal Solution Calculation.

The separation measures for each alternative is the best/worst calculated as follows:

$$d_{ib} = \sqrt{\sum_{j=1}^{n} (t_{ij} - t_{bj})^2}, i = 1, 2, ..., m$$

$$(8)$$

$$d_{iw} = \sqrt{\sum_{j=1}^{n} (t_{ij} - t_{wj})^2}, i = 1, 2, ..., m$$

$$(9)$$

Step 6: The Relative Closeness to the Ideal Solution for Each Alternative Calculation:

For each alternative, the relative closeness to the ideal solution s_{iw} is computed as follows.

$$s_{iw} = \frac{d_{iw}}{d_{ib} + d_{iw}}, 0 \le s_{iw} \le 1, i = 1, 2, ..., m \tag{10}$$

$s_{iw} = 0$ if and only if the alternative solution has the worst condition whereas $s_{iw} = 1$ if and only if the alternative solution has the best condition.

Step 7: Rank the alternatives.

The alternatives are ranked in descending order according to the relative closeness coefficient, s_{iw} with the highest values s_{iw} representing the best alternative.

RESULT AND DISCUSSION

The decision matrix in Table 2 was used to perform both the normalization and the weighting of the normalized decision matrix. Using Equations (8) and (9), the distances of all alternatives from the positive ideal solution (d_{ib}) and the negative ideal solution (d_{iw}) are calculated and presented in Table 3.

Table 2. Multicriteria Decision Making Matrix

Company Code	Current Ratio	P/E Ratio - Close	Gross Profit Margin	Return On Equity - Total (%)	Operating Profit Margin	Earnings Per Share	Dividend Yield	Total Debt % Common Equity	Total Debt % Total Assets
C1	1.75	15.32	25.29	5.53	15	0.41	4.47	44.66	27.01
C2	1.44	15.97	57.43	22.94	46.77	0.21	3.87	26.08	17.19
C3	3.83	18.91	52.45	6.99	22.53	0.28	2.72	65.96	40.75
C4	1.69	12.82	11.98	12.46	3.12	0.02	0	113.91	31.75
C5	3.86	-31.05	-1.67	-7.91	-10.99	0	0.81	24.54	16.86
C6	2.45	3.82	22.18	15.85	15.72	0.17	1.92	11.42	8.88
C7	3.84	3.13	25.85	21.75	18.08	0.49	4.44	6.64	4.54
C8	1.28	7.44	12.44	16.32	8	0.12	2.78	46.78	18.16
C9	4.72	19.44	27.95	3.1	12.92	0.17	3.23	6.87	5.32
C10	0.96	7.78	29.53	9.1	9.33	0.05	4.17	116.62	48.03
C11	0.27	7.28	35.71	51.95	19.58	0.04	0	222.37	26.4
C12	25.68	6.24	21.2	9.84	12.91	0.09	0	0.27	0.27
C13	2.09	7.51	24.17	11.27	5.75	0.09	8.26	39.28	21.93
C14	0.72	13.37	16.99	3.32	3.48	0	0	158.22	54.37
C15	1.33	-0.45	97.67	-1557.01	-193.11	0	0	-76.48	7.31
C16	0.68	-2.45	-6.23	-27.66	-7.08	0	0	124.94	28.46
C17	1.91	2.34	25.09	16.35	9.98	0	0	7.93	5.01
C18	1.52	18.58	10.5	2.63	2.38	0.05	3.16	37.25	22.29
C19	0.81	16.06	0.89	4.19	-0.31	0	1.67	73.63	21.51

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C20	0.82	-13.39	84.27	-9.58	-39.2	0	0	49.6	27.74
C21	0.62	-22.25	19.69	-1.77	-2.69	0	0	19.44	12.85
C22	1.85	-44.62	63.62	-1.97	-6.27	0.01	2.52	40.21	24.6
C23	1.03	-3.62	23.32	-8.23	-7.82	0	2.04	82.56	40.79
C24	0.86	16.79	56.23	3.05	18.49	0.13	0	126.18	22.21
C25	1.79	21.18	22.86	2.68	3.71	0.06	2.62	62.69	34.47

Source: DataStream

Table 3. Distance of the Alternatives from The Positive Ideal Solution (d_{ib}) and Negative Ideal Solution (d_{iw})

Company Code	(d_{ib})	(d_{iw})	S_{iw}
C1	0.10059746	0.617504966	0.8599121
C2	0.049736809	0.702741154	0.93390264
C3	0.082924151	0.637257352	0.88485659
C4	0.135940549	0.58561357	0.81160034
C5	0.170527747	0.547986799	0.76266626
C6	0.100376845	0.619349742	0.86053475
C7	0.090425806	0.62665803	0.87389786
C8	0.120829108	0.598825624	0.83210128
C9	0.106600915	0.611444882	0.85154023
C10	0.118398103	0.602028148	0.83565548
C11	0.096836522	0.630868123	0.86692881
C12	0.1030429	0.612892792	0.85607241
C13	0.125543639	0.593049069	0.82529236
C14	0.136021039	0.586150508	0.81164996
C15	0.705792004	0.019169776	0.02644246
C16	0.162610059	0.557024947	0.77403815
C17	0.118111274	0.604032479	0.83644354
C18	0.136476056	0.583348505	0.81040372
C19	0.144803144	0.576237154	0.79917469
C20	0.248036267	0.474691517	0.65680541
C21	0.15015411	0.569936997	0.79147901
C22	0.157729028	0.560848773	0.78049833
C23	0.163317588	0.556000118	0.77295486
C24	0.097662983	0.626056541	0.8650541
C25	0.13315785	0.586831209	0.81505573

Table 4. Ranking of Transportation companies

Company Name	Company Code	Rank
WESTPORTS HOLD	C2	1
BINTULU PORT	C3	2
HARBOUR-LINK GROUP	C7	3
AVANGAAD BHD	C11	4
PERAK CORP BHD	C24	5
SHIN YANG GROUP BHD	C6	6
MISC BHD	C1	7

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MAYBULK BHD	C12	8
SURIA CAPITAL HLDGS	C9	9
TAS OFFSHORE	C17	10
SWIFT HAULAGE BHD	C10	11
TASCO BHD	C8	12
FM GLOBAL	C13	13
TRI-MODE SYSTEM	C25	14
TIONG NAM LOG HLDGS	C14	15
CHIN HIN GROUP	C4	16
CJ CENTURY LOGISTICS	C18	17
STRAITS ENERGY	C19	18
SEALINK INTERNAT	C21	19
SEE HUP CONSOL	C22	20
POS MALAYSIA BHD	C16	21
XIN HWA	C23	22
GDEX BHD	C5	23
G CAPITAL BHD	C20	24
BOUSTEAD HEAVY	C15	25

Table 2 presents the multicriteria decision-making matrix consisting of key financial indicators such as current ratio, P/E ratio, gross profit margin, return on equity, operating profit margin, earnings per share, dividend yield, and debt structure. These indicators provide a comprehensive view of the financial position and performance of the transportation companies under study. The data indicate significant variations across firms, reflecting differences in liquidity, profitability, and leverage management. For instance, **WESTPORTS HOLD** (C2) records strong return on equity (46.77%) and high profit margins, suggesting efficiency in generating shareholder value. In contrast, **BOUSTEAD HEAVY (C15)** shows extremely poor financial indicators with negative returns (–193.11%) and operating losses, highlighting financial distress. Similarly, **MAYBULK BHD** (C12) displays a very high current ratio (25.68), which could imply excess idle assets, suggesting inefficiency in asset utilization.

Table 3 further summarizes the results of the TOPSIS analysis by computing the distance of each company from the positive ideal solution, the negative ideal solution , and the closeness coefficient. The closeness coefficient reflects the extent to which each company approaches the ideal financial performance. The results reveal that **WESTPORTS HOLD** (C2) achieves the highest closeness value (0.9339), followed by **BINTULU PORT** (C3) (0.8849), **HARBOUR-LINK GROUP** (C7) (0.8739), **AVANGAAD BHD** (C11) (0.8669), and **PERAK CORP BHD** (C24) (0.8651). These companies are considered the strongest performers, as their financial structures are closest to the ideal benchmark. Conversely, **G CAPITAL BHD** (C20 records the lowest closeness coefficient (0.0264), reflecting severe underperformance, while **G CAPITAL BHD** (C20) (0.6568) and **XIN HWA** (C23) (0.7729) also fall significantly below the benchmark. These outcomes indicate that profitability, debt efficiency, and balanced liquidity are the main drivers of stronger rankings, whereas excessive debt, persistent losses, and poor asset utilization lead to weaker performance.

Table 4 shows the ranking of 25 transportation companies in Malaysia, based on how close they are to the ideal solution (S_{iw}), as calculated using the TOPSIS method. This ranking reflects each company's

overall financial performance in 2024. Companies with higher S_{iw} values are considered financially stronger, as they performed better across the selected financial indicators.

The results indicate that **WESTPORTS HOLD** (C2) ranked highest, followed by **BINTULU PORT** (C3) and **HARBOUR-LINK GROUP** (C7), reflecting strong financial performance. These companies demonstrate financial stability and operational efficiency, making them potentially attractive to investors in the transportation sector.

Conversely, **GDEX BHD** (C5), **G CAPITAL BHD** (C20), and **BOUSTEAD HEAVY** (C15) ranked lower, suggesting comparatively weaker financial standing. Further analysis is recommended for investors to understand the factors contributing to their performance.

CONCLUSION

This study highlights the importance of financial performance in shaping competitiveness within Malaysia's transportation sector. Using the TOPSIS method, a replicable framework was applied to evaluate firms based on liquidity, profitability, leverage, and efficiency, validated against Bursa Malaysia data. The findings show **WESTPORTS HOLD** (C2) and **BINTULU PORT** (C3) as industry leaders, supported by strong profitability, stable liquidity, and prudent debt management. Mid-ranked firms such as **HARBOUR-LINK GROUP** (C7), **AVANGAAD BHD** (C11), and **PERAK CORP BHD** (C24) reflect partial resilience but face liquidity and earnings pressures, while lower-ranked firms including **BOUSTEAD HEAVY** (C15), **G CAPITAL BHD** (C20), and **GDEX BHD** (C5), exhibit weak financial health, undermining long-term viability. Although the results affirm that sound financial management drives competitiveness and investor confidence, the study is limited to one year of financial ratios and excludes qualitative factors. Future research should incorporate multi-year data, governance and ESG indicators, and alternative MCDM methods to provide a more comprehensive assessment of firm performance.

CONFLICT OF INTEREST

The authors affirmed that there is no conflict of interest in this article.

CO-AUTHOR CONTRIBUTION

All authors contributed substantially to the development of this study. Author 1 conceptualized the study, performed the data analysis, and drafted the initial manuscript. Author 2 contributed to the methodology design, literature review, and critical revision of the manuscript. Both authors have read and approved the final version of the manuscript.

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