INTERNATIONAL JOURNAL OF BUSINESS AND MANAGEMENT (IJBM)
ISSN: 2815-9330 (Online)

VOL. 5, NO. 2 2026 https://iessociety.org/

An integral financial indicator approach to ranking technology service companies: An empirical analysis

Mikayel Rafayel Gyulasaryan[1*] , Ashot Varazdat Matevosyan[2] and Mane Henrik Matevosyan[3*]

[1]Parvanyan Consulting LLC, Head of Research and Analytical Department Yerevan, Armenia; Ph.D. in Economics, Associate Professor; ORCID: https://orcid.org/0009-0005-4234-1377

[2]Armenian State University of Economics, Faculty of Applied Finance Yerevan, Armenia; Doctor of Economic sciences, Professor, ORCID https://orcid.org/0000-0003-1741-0172
Email: matevosyan.ashot@asue.am

[3]Armenian State University of Economics, Faculty of Applied Finance, Yerevan, Armenia; Ph.D. in Economics, Associate Professor; ORCID https://orcid.org/0009-0001-3529-5174
Email: manematevosyan55@gmail.com

*Correspondence: mikayelgyulasaryan@gmail.com

Abstract

This paper develops a sector-adaptive integral financial indicator framework for evaluating and ranking technology service companies. While composite indices are widely used in financial performance analysis, existing approaches remain largely sector-neutral, overlook the directional heterogeneity of financial indicators, and rely on single aggregation structures, potentially leading to biased or incomplete assessments. To address these limitations, the paper proposes a multidimensional composite index that integrates profitability, leverage, and capital structure within a unified analytical framework. The methodology introduces three key innovations: (i) a sector-specific design tailored to the financial characteristics of technology service firms, (ii) a direction-sensitive normalization procedure that explicitly distinguishes between beneficial and non-beneficial indicators, and (iii) a dual aggregation structure combining additive and geometric methods to evaluate compensatory and non-compensatory effects. The proposed approach is applied to a longitudinal dataset of leading technology service companies over the period 2012–2024. The results reveal substantial heterogeneity in financial performance, with a clear differentiation between improving, stable, and at-risk firms. The analysis also demonstrates that aggregation structure and indicator directionality significantly influence ranking outcomes, underscoring the importance of methodological design in composite index construction. Robustness and sensitivity analyses confirm the stability and reliability of the proposed framework. The study contributes to the literature by advancing composite index methodology through a sector-adaptive and directionally consistent approach, while providing a transparent and

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

replicable tool for firm ranking. From a practical perspective, the framework offers valuable implications for investors, analysts, and policymakers by enabling more accurate benchmarking and informed decision-making in technology-driven markets.

***Keywords*:** Integral Index, Financial Performance, Technology Service Companies, Firm Ranking, Profitability, Leverage, Capital Structure, Composite Indicators, Empirical Analysis

JEL Classification: F21, H25, O16, O55

1. Introduction

In recent decades, the rapid expansion of the technology services sector has fundamentally reshaped modern economies, increasing the demand for accurate and multidimensional financial performance evaluation. Technology service companies differ markedly from traditional industries due to their high reliance on intangible assets, scalable business models, and dynamic capital structures. These characteristics complicate the application of conventional financial analysis tools and call for more advanced and context-sensitive evaluation frameworks (Tan & Lim, 2021; Singh & Sharma, 2022). Traditional approaches to financial performance assessment are predominantly based on individual financial ratios, such as profitability, leverage, and liquidity indicators. While these metrics provide valuable insights into specific aspects of firm performance, they remain inherently limited in capturing the overall financial condition of firms operating in complex and rapidly evolving environments. In particular, ratio-based analysis lacks an integrated structure capable of simultaneously reflecting multiple financial dimensions and their interactions, leading to fragmented and potentially inconsistent evaluations. To address these limitations, the literature has increasingly shifted toward the use of composite or integral indices, which aggregate multiple indicators into a single synthetic measure (OECD, 2008; Mazziotta & Pareto, 2011). These approaches enhance comparability and allow for a more holistic assessment of firm performance. However, despite their methodological advantages, existing composite index frameworks exhibit several important shortcomings. First, most composite indices are constructed as sector-neutral tools, implicitly assuming homogeneous financial structures across industries. This assumption is particularly problematic in the context of technology service companies, where financial dynamics are strongly influenced by intangible assets, innovation intensity, and flexible financing strategies. As a result, sector-neutral indices may fail to accurately capture the economic reality of such firms and may produce biased or misleading rankings.

Second, existing approaches often do not explicitly account for the directional heterogeneity of financial indicators. In many studies, normalization procedures are applied uniformly without distinguishing between indicators where higher values are desirable (e.g., profitability ratios) and those where lower values are preferable (e.g., leverage measures). This omission can introduce systematic bias into composite scores and reduce the interpretability of results. Third, the issue of

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

aggregation structure remains insufficiently explored. Most empirical studies rely on a single aggregation method—typically additive—implicitly assuming full compensability between indicators. However, this assumption may obscure the impact of weak performance in critical financial dimensions, particularly in risk-sensitive sectors such as technology services. Finally, while multi-criteria decision-making (MCDM) methods offer advanced tools for firm ranking, they often involve methodological complexity and limited transparency, which may hinder their practical applicability for investors and analysts.

Taken together, these limitations highlight a clear gap in the literature: the absence of a sector-adaptive, direction-sensitive, and methodologically robust framework for evaluating and ranking technology service companies. In response to this gap, the present study develops an integral financial indicator approach that integrates profitability, leverage, and capital structure into a unified composite index. The proposed framework introduces three key methodological advancements. First, it adopts a sector-specific design, explicitly reflecting the financial characteristics of technology service firms. Second, it implements a direction-sensitive normalization procedure, ensuring consistency between the economic interpretation of indicators and their contribution to the composite score. Third, it incorporates a dual aggregation structure, combining additive and geometric methods to evaluate compensatory and non-compensatory effects in financial performance measurement.

The empirical analysis is conducted using a longitudinal dataset of leading technology service companies over the period 2012–2024. The proposed index is applied to generate firm rankings, and its robustness is assessed through sensitivity and stability analysis. This allows for a comprehensive evaluation of both cross-sectional differences and dynamic performance patterns within the sector. This study contributes to the literature in several important ways. It extends composite index methodology by introducing a sector-adaptive and directionally consistent framework, enhances methodological rigor through dual aggregation analysis, and provides a transparent and replicable tool for firm ranking. From a practical perspective, the proposed approach offers valuable insights for investors, analysts, and policymakers by enabling more accurate benchmarking and informed decision-making in technology-driven markets.

2. Literature Review and Hypotheses Development

2.1 Composite Indicators in Financial Performance Assessment

Composite indicators have become a widely used tool in economic and financial analysis to synthesize multidimensional information into a single measurement measure. The main frameworks emphasize the importance of normalization, weighting, and aggregation procedures to ensure comparability and interpretability of results (OECD, 2008; Mazziotta & Pareto, 2011). Despite their methodological maturity, existing composite index approaches exhibit an important limitation: they are largely designed as sector-neutral tools, assuming uniform financial structures across industries.

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

However, financial dynamics differ significantly across industries, particularly in technology service companies, where intangible assets, scalability, and innovation intensity play a dominant role.

Research Gap 1: Current composite index methodologies do not sufficiently capture sectoral financial structures, leading to reduced relevance and potential misclassification in firm rankings. Our Contribution: This study addresses this limitation by developing a sector-adaptive composite financial index that is specifically tuned to reflect the structural characteristics of technology services firms.

2.2 Financial Ratio Analysis and Its Limitations

Financial ratio analysis remains a cornerstone of firm performance assessment, with profitability, leverage, and liquidity ratios widely used to assess operating efficiency and financial stability (Brigham and Erhardt, 2016). Empirical evidence suggests that the combination of multiple ratios improves explanatory power compared to single-ratio approaches. However, traditional ratio-based analysis suffers from important shortcomings.

- it considers indicators independently, ignoring their joint interaction
- it lacks a unified framework for summarizing multidimensional performance
- it is less effective in sectors characterized by intangible assets and dynamic capital structures

Research Gap 2: Existing approaches fail to provide a systematic and integrated framework that reflects the multidimensional nature of financial performance, particularly in technology-intensive sectors. Our Contribution: We propose an integrated framework for financial indicators that combines the main financial measures: profitability, leverage, and capital structure, into a single composite index, allowing for a holistic and structurally consistent assessment of a company's performance.

2.3 Normalization and Indicator Orientation

Normalization is a fundamental step in constructing a composite index that ensures the comparability of indicators at different scales (Dekank and Lugo, 2013). Most studies use standard normalization methods, such as min-max scaling or z-score transformation. However, an important methodological issue often remains underexplored. The direction of the indicators (i.e., whether higher values are desirable or undesirable). In many cases, indicators are normalized without explicitly considering their economic interpretation, which can introduce bias into the aggregated index.

Research Gap 3: The literature does not sufficiently address the asymmetric economic meaning of financial indicators, which leads to potential distortions in composite scores. Our Contribution: This study presents a direction-sensitive normalization scheme that clearly distinguishes between

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

useful and non-useful indicators, thus improving the internal consistency and economic validity of the composite index.

2.4 Aggregation Methods and Compensation Issues

Aggregation plays a central role in determining how individual indicators contribute to the final composite score. The aggregation method is widely used due to its simplicity and transparency, but it assumes full compensation, where poor performance in one dimension can be compensated for by strong performance in another. Recent studies highlight the limitations of this assumption and suggest alternative aggregation methods, including geometric or non-compensating approaches (Greco et al., 2019; Maziotta and Pareto, 2011).

Research Gap 4: Most empirical studies rely on a single aggregation method without examining how different aggregation structures affect classification results and sensitivity to weak indicators. Our Contribution: We address this limitation by implementing a dual aggregation framework, combining additive and geometric methods, which allows us to evaluate compensatory versus non-compensatory effects and enhance the robustness of firm rankings.

2.5 Firm Ranking and MCDM Approaches

Multi-criteria decision-making (MCDM) methods such as TOPSIS, VIKOR, and PROMETHEE have been widely applied for firm ranking, offering structured approaches to handle multidimensional evaluation problems (Zavadskas et al., 2016; Kaya et al., 2024). While effective, these methods often involve:

- complex computational procedures
- subjective weighting schemes
- limited transparency for practical users

Research Gap 5: There is a lack of transparent, replicable, and practitioner-oriented ranking frameworks that balance methodological rigor with interpretability.

Our Contribution: The proposed integral index provides a transparent and operational alternative to complex MCDM methods, ensuring ease of interpretation while maintaining analytical robustness.

2.6 Sector-Specific Gap: Technology Service Companies

Although prior studies have explored composite indices and firm performance evaluation, relatively limited attention has been given to technology service companies as a distinct analytical domain. These firms exhibit unique characteristics:

- high reliance on intangible assets
- flexible and evolving capital structures

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

- higher volatility and innovation-driven growth

Research Gap 6 (Core gap): There is no widely accepted framework that simultaneously:

- integrates multiple financial dimensions
- accounts for indicator directionality
- adapts to sector-specific financial structures
- and provides a consistent ranking mechanism for technology service firms

Our Contribution (Core Solution). This study develops a comprehensive, sector-adaptive, direction-sensitive, and methodologically robust composite index framework, specifically designed to address the financial evaluation challenges of technology service companies.

3. Research Methodology

This study proposes an integral financial indicator approach for ranking technology service companies. The methodology integrates multiple financial dimensions into a single composite index, enabling simultaneous assessment of profitability, leverage, and capital structure.

3.1. Indicator System

Let n denote the number of firms and m the number of financial indicators. Each firm i is represented by a vector of indicators: $Xi = (X_{i1}, X_{i2},...,X_{im})$. The indicators are classified as follows:

I. Profitability (Higher = Better)

- X_1: ROA (Return on Assets).
- X_2: ROE (Return on Equity).
- X_3: Gross Profit /Total Assets.

II. Leverage (Higher = Worse)

- X_4: Total Liabilities / Equity.
- X_5: Long-Term Debt / (Long-Term Debt + Equity).

III. Capital Structure (Higher = Better)

- X_6: Equity / Total Assets.
- X_7: (Current Assets – Current Liabilities) / Equity .

These indicators reflect key dimensions of firm performance, financial risk, and stability (Brigham & Ehrhardt, 2016; Gyulasaryan et al., 2025).

3.2. Data Normalization

To ensure comparability across different measurement units, Min-Max normalization is applied:

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

For beneficial indicators (higher is better): $Z_{ij}=(X_{ij}-\min(X_j))/ (\max(X_j)-\min (X_j))$

For non-beneficial indicators (higher is worse): $Z_{ij}=(\max(X_j)-X_{ij})/(\max X_j)-\min(X_j))$

Where Z_{ij} represents the normalized value of indicator j for firm i (Decancq & Lugo, 2013a; OECD, 2008).

3.3 Weight Determination (Expert Weights)

Weights w_j are assigned to each indicator based on its relative importance for financial performance evaluation. The proposed weight allocation is:

Table 1. Proposed weights for indicators to be included in the integral financial **index**

Indicator	Weight w_j	Justification
X_1-ROA	15%	Measures efficiency in asset utilization.
X_2-ROE	20%	Captures equity profitability, crucial for investors.
X_3-Gross Profit / Total Assets	15%	Provides overall profitability relative to assets.
X_4-Total Liabilities / Equity	10%	Measures financial risk; higher values are unfavorable.
X_5-Long-Term Debt / (Debt + Equity)	10%	Indicates long-term financial stability.
X_6-Equity / Total Assets	20%	Reflects financial stability; higher ratios are preferable.
X_7-(Current Assets – Current Liabilities) / Equity	10%	Assesses liquidity and capital coverage.

The total weight satisfies the condition:

$$\sum_{j=1}^{m} wj = 1$$

3.4. Composite Index Calculation

Two aggregation methods are considered:

1. Linear (Additive) Aggregation: $CI_i=\sum_{j=1}^{m} wj * Z_{ij}$

2. Geometric Aggregation: $CIi= \prod_{j=1}^{m} Z_{ij}^{wj}$

Where:

- CI_i - composite index for firm i.
- Z_{ij} — normalized value of indicator j.

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

- w_j — weight of indicator j.

The geometric method is more sensitive to low-performing indicators, penalizing firms with poor performance in any dimension (Mazziotta & Pareto, 2011a; Greco et al., 2019).

3.5 Ranking Mechanism

Firms are ranked in descending order of $\mathbf{CI_i}$. A rating scale is applied:

- $CIi>0.8$ → High performance.
- $0.6 \leq CIi \leq 0.8$ → Good performance.
- $0.4 \leq CIi < 0.6$ → Average performance.
- $CI_i<0.4$ → At risk.

This classification provides clear decision-making guidance for investors and managers (Huang, 2025a; Chen & Hu, 2023).

3.6. Model Validation

1. Sensitivity Analysis: Examines how changes in indicator weights affect rankings.

2. Robustness Check: Verifies stability of rankings under data perturbations.

3. Correlation Analysis: Compares the composite index with individual financial performance metrics to ensure consistency (Kaya et al., 2024a; Zavadskas et al., 2016).

3.7. Methodological Considerations

- High correlation between ROA and ROE may influence index sensitivity.
- Outliers and extreme values can skew additive aggregation; geometric aggregation may mitigate this effect.
- Intangible assets in technology firms are often underrepresented, affecting conventional ratios (Gyulasaryan et al., 2025; Liu & Zhang, 2019).

3.8. Conclusion

The proposed methodology integrates multidimensional financial indicators into a single composite index, enabling holistic evaluation of profitability, risk, and capital structure. This approach provides a replicable framework for ranking technology service companies, facilitating investment decisions, benchmarking, and financial monitoring.

4. Results and Discussion

In this study, the financial performance of publicly listed technology service companies—including Accenture, ServiceNow, Vertiv Holdings, CoStar, Roper Technologies, Cognizant Technology Solutions, Fair Isaac, Wipro, and Leidos Holdings-was analyzed. The data for the

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

analysis were obtained from the financial statements of the examined companies, ensuring that all indicators used in the integrated assessment accurately reflect their reported financial performance. (Macrotrends. (2026.03.20.). Using the selected set of financial indicators, the evaluation yielded the following conclusions regarding their integrated performance across profitability, leverage, and capital structure dimensions. A comparative analysis of the profitability indicators of the researched technology companies, based on ROA, ROE, and the ratio of gross profit to total assets for 2012-2024, is presented in table 2.

Table 2. Results of the systematic analysis of the profitability component in technology companies

Company	Profitability Indicators	Annual Trends and Key Observations
Accenture	ROA, ROE, Gross Profit / Total Assets	Demonstrates the highest and most stable profitability metrics with an average ROA around 15–16%, and ROE ranging between 25–40%. In 2024, ROA was 11.98%, ROE 24.29%, and Gross Profit/Total Assets 21.46%, reflecting strong and consistent operational efficiency and asset management.
ServiceNow	Fluctuating and declining values	ROA and ROE show significant volatility, including negative values in several years. Gross Profit/Total Assets exhibits extreme fluctuations, indicating financial uncertainty and high risk.
Vertiv Holdings	Lower stability and negative figures	Profitability metrics are mostly below average from 2019 onwards, with considerable volatility indicating financial instability and possible debt burden.
CoStar	Low but steady growth	ROA and ROE are relatively low but stable, indicating moderate profitability within a range of 1.5% to 9%. Gross Profit/Total Assets align with this moderate financial profile.
Roper Technologies	Moderate to high and stable	ROA ranges from 3% to 10%, ROE between 6% and 17%, and Gross Profit/Total Assets between 7.5 and 23, reflecting consistent profitability and sound asset utilization.
Cognizant Technology Solutions	Stable and relatively high	ROA averages around 10–12%, ROE between 15–20%, and Gross Profit/Total Assets between 20 and 30, indicating a strong financial position and efficient operations.
Fair Isaac	Highly volatile and negative ROE	Despite high ROA values (7–34%), ROE is deeply negative and highly volatile (reaching -353% in 2020),

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

		raising concerns about financial management. Gross Profit/Total Assets also show wide fluctuations, signaling elevated financial risk.
Wipro	Stable and strong	ROA between 10–13%, ROE between 15–22%, and Gross Profit/Total Assets between 20 and 40, indicating consistent profitability and efficient asset management.
Leidos Holdings	Volatile and unstable	ROA and ROE experience significant fluctuations with occasional negative values. Gross Profit/Total Assets also show wide variability, indicating uncertain financial health.

Key Conclusions

- Accenture and Cognizant Technology Solutions exhibit stable and strong profitability, supported by effective asset management, positioning them as sector leaders in the analyzed metrics.
- ServiceNow and Fair Isaac show considerable volatility and inconsistent financial indicators, reflecting unstable financial conditions.
- Vertiv Holdings and Leidos Holdings reveal significant fluctuations and financial instability, including periods of negative profitability.
- Companies such as CoStar, Roper Technologies, and Wipro demonstrate moderate to strong and stable profitability without major fluctuations.

A comparative analysis of the financial leverage ratios of the surveyed technology companies based on Total Liabilities / Equity Long-Term Debt / (Long-Term Debt + Equity) for 2012-2024 is presented in Table 3.

Table 3. Results of the systematic analysis of the financial leverage component in technology companies

Company	Financial Leverage Indicators	Annual Trends and Key Observations
Accenture	X_4 (Total Liabilities / Equity), X_5 (Long-term Debt / (Long-term Debt + Equity))	Demonstrates a stable and declining leverage profile. The X_4 ratio decreased significantly from 2.108 in 2012 to 1.028 in 2024, while X_5 remained near zero for most of the period. The slight increase in X5 to 0.135 in 2024 indicates limited use of long-term debt. Overall, the company maintains a strong and conservative financial structure.

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

ServiceNow	X_4, X_5	Exhibits a transition from high to moderate leverage. The X_4 ratio declined sharply from 4.256 to 1.008, while X_5 decreased from 0.568 to 0.103. These trends suggest a gradual reduction in financial risk and a shift toward a more balanced capital structure.
Vertiv Holdings	X_4, X_5	Characterized by high volatility in leverage ratios. X_4 shows extreme fluctuations, including negative values in earlier years, while X_5 declined from 1.255 to 0.468. Despite recent improvements, the company still reflects elevated financial risk.
CoStar	X_4, X_5	Maintains very low and stable leverage levels. X_4 remains within the range of 0.08–0.41, while X_5 is close to zero in several years. This indicates a strong reliance on equity financing and minimal exposure to long-term debt.
Roper Technologies	X_4, X_5	Displays moderate and stable leverage. X_4 fluctuates between 0.6 and 1.4, while X_5 ranges from 0.25 to 0.50. The company follows a balanced financial strategy with controlled use of debt.
Cognizant Technology Solutions	X_4, X_5	Shows low and stable leverage ratios. X_4 remains within 0.3–0.56, and X_5 is consistently below 0.1. This reflects a conservative financial policy and strong internal financing capacity.
Fair Isaac	X_4, X_5	Exhibits extremely high and risky leverage. X_4 includes negative values due to negative equity, while X_5 exceeds 1, reaching up to 2.918. These indicators suggest heavy dependence on debt financing and significant financial risk.
Wipro	X_4, X_5	Demonstrates stable and low leverage. X_4 ranges between 0.45 and 0.64, while X_5 remains below 0.08 in most years. The company maintains a conservative and financially stable structure.
Leidos Holdings	X_4, X_5	Reflects relatively high but stable leverage. X_4 ranges from 1.6 to 2.3, while X_5 remains between 0.45 and 0.55. This indicates consistent use of debt as part of a growth-oriented financial strategy.

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

Key Conclusions

The comparative analysis of financial leverage indicators (X4 and X5) for the selected technology companies over the period 2012–2024 leads to the following key conclusions:

- **Prevalence of Conservative Capital Structures**. A significant number of companies, including Accenture, CoStar, Cognizant Technology Solutions, and Wipro, maintain low leverage ratios, indicating a strong reliance on equity financing and prudent financial management practices.

- **Clear Deleveraging Trend.** Companies such as ServiceNow and Accenture demonstrate a noticeable decline in leverage over time, reflecting improved financial stability and a strategic shift toward reducing dependence on debt financing.

- **Balanced Leverage Strategies.** Roper Technologies and Leidos Holdings exhibit moderate and relatively stable leverage levels, suggesting a balanced approach to capital structure, where debt is used efficiently without significantly increasing financial risk.

- **High Leverage and Elevated Financial Risk.** Vertiv Holdings and Fair Isaac stand out due to their high and volatile leverage ratios. In particular, Fair Isaac shows extreme values, including negative equity and very high long-term debt proportions, indicating substantial financial risk and potential structural imbalances.

- **Heterogeneity Across the Sector.** The analysis reveals considerable variation in financial leverage strategies among technology companies, ranging from highly conservative to aggressively leveraged models, reflecting differences in business models, growth strategies, and risk tolerance.

- **Improvement in Financial Stability Over Time.** Despite variations, the overall trend across the sector suggests gradual improvement in financial stability, as evidenced by declining leverage ratios and more controlled use of long-term debt in recent years.

A comparative analysis of the Financial Capital Structure indicators of the surveyed technology companies, based on the ratios of Equity / Assets, (Current assets − Current liabilities) / Equity for 2012-2024, is presented in Table 4.

Table 4. Results of the systematic analysis of the Capital Structure component in technology companies

Company	Financial Capital Structure Indicators	Annual Trends and Key Observations

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

Accenture	X_6 (Equity / Assets), X_7 ((Current Assets – Current Liabilities) / Equity)	Demonstrates a stable and gradually improving capital structure. X_6 increased from 0.322 in 2012 to 0.493 in 2024, indicating strengthening equity financing. X_7 shows a declining trend from historically high levels, stabilizing around 0.2–0.3 in recent years, suggesting improved working capital management and reduced excess liquidity.
ServiceNow	X_6, X_7	Shows significant improvement in capital structure over time. X_6 increased from 0.19–0.34 in earlier years to 0.498 in 2024, reflecting growing equity financing. X_7 declined sharply from very high levels (above 1) to near zero (0.002), indicating reduced liquidity buffers and more efficient use of working capital.
Vertiv Holdings	X_6, X_7	Characterized by weak and volatile capital structure. X_6 includes negative values in earlier periods, indicating negative equity, but improved to 0.323 by 2024. X_7 also shows extreme volatility, including negative values, reflecting instability in working capital and financial structure.
CoStar	X_6, X_7	Maintains a very strong and stable capital structure. X_6 remains consistently high (0.70–0.92), indicating strong equity financing. X_7 shows moderate but stable values, suggesting effective working capital management and solid liquidity position.
Roper Technologies	X_6, X_7	Exhibits moderate and relatively stable capital structure. X_6 fluctuates between 0.4 and 0.6, while X_7 includes negative values in several years, indicating occasional working capital deficits. Overall, the company maintains a balanced but slightly constrained liquidity position.
Cognizant Technology Solutions	X_6, X_7	Demonstrates strong and stable capital structure. X_6 remains high (around 0.64–0.75), while X_7 shows consistently positive values (0.27–0.7), indicating

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

		solid liquidity and efficient working capital management.
Fair Isaac	X_6, X_7	Exhibits highly unstable and risky capital structure. X_6 includes negative values in multiple years, reflecting negative equity. X_7 is highly volatile, with both positive and negative values, indicating inconsistent working capital management and elevated financial risk.
Wipro	X_6, X_7	Shows stable and strong capital structure. X_6 remains consistently high (0.61–0.68), while X_7 maintains stable positive values (around 0.5–0.65), indicating strong liquidity and conservative financial management.
Leidos Holdings	X_6, X_7	Reflects relatively low but stable equity levels. X_6 remains around 0.30–0.38, indicating moderate reliance on equity financing. X_7 shows variability, including occasional negative values, suggesting fluctuations in working capital and liquidity conditions.

Key Conclusions

1. Strong Equity-Based Structures. Companies such as CoStar, Cognizant, and Wipro exhibit consistently high X_6 ratios, indicating strong capitalization and low dependence on external financing.
2. Improving Capital Structures. Accenture and ServiceNow demonstrate clear improvements in equity ratios over time, reflecting strengthening financial positions and reduced reliance on liabilities.
3. Liquidity Management Differences. X_7 reveals significant variation across firms: while Wipro and Cognizant maintain stable liquidity, companies like Roper and Leidos experience periodic working capital constraints.
4. High Risk and Structural Weaknesses. Vertiv Holdings and Fair Isaac show negative equity and volatile X_7 values, indicating financial instability and elevated risk.
5. Sectoral Heterogeneity. The analysis confirms substantial differences in capital structure strategies, ranging from conservative (high equity, stable liquidity) to volatile and risk-prone models.

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

The rating index for the analyzed technology companies was calculated using the proposed methodology, and the obtained results are presented in Table 5.

Table 5. Calculated Rating Index for Technology Companies

	2024	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
Accenture	0.296	0.425	0.466	0.46	0.415	0.445	0.556	0.541	0.468	0.653	0.503	0.552	0.697
ServiceNow	0.744	0.735	0.833	0.579	0.531	0.509	0.605	0.455	0.349	0.092	0.417	0.423	0.476
Vertiv Holdings	0.75	0.744	0.699	0.656	0.651	0.405	0.442						
CoStar	0.382	0.576	0.582	0.501	0.44	0.878	0.857	0.712	0.393	0.073	0.228	0.271	0.09
Roper Technologies	0.491	0.51	0.401	0.243	0.097	0.772	0.507	0.547	0.269	0.612	0.737	0.597	0.641
Cognizant Technology Solutions	0.41	0.444	0.508	0.421	0.059	0.389	0.607	0.346	0.488	0.538	0.476	0.917	0.974
Fair Isaac	0.479	0.492	0.496	0.485	0.529	0.596	0.578	0.538	0.679	0.656	0.645	0.639	0.671
Wipro	0.284	0.213	0.247	0.236	0.628	0.593	0.5	0.3	0.432	0.548	0.83	0.905	0.736
Leidos Holdings	0.58	0.405	0.463	0.451	0.386	0.582	0.6	0.543	0.437	0.615	0.098	0.578	0.837

The calculated rating index reflects the integrated financial performance of the analyzed technology companies, incorporating profitability, leverage, and capital structure indicators. The values range between 0 and 1, where higher values indicate stronger overall financial performance and stability.

Company-Level Analysis

Accenture: Accenture demonstrates moderate but stable performance. The index shows a gradual decline from 0.697 (2012) to 0.296 (2024), with intermittent recoveries. This trend suggests slight weakening in relative financial positioning, although stability remains high.

ServiceNow: ServiceNow exhibits a strong upward trajectory. The index increased significantly from 0.092 (2015) to 0.744 (2024), indicating substantial improvement in financial performance, likely driven by better profitability and reduced leverage.

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

Vertiv Holdings: Vertiv Holdings shows consistently high index values (0.65–0.75 range in recent years). Despite earlier structural weaknesses, the company demonstrates notable stabilization and improved financial strength.

CoStar: CoStar is characterized by high volatility. The index peaked at 0.878 (2019) but declined to 0.382 (2024). This suggests fluctuating performance, possibly due to changing profitability and investment cycles.

Roper Technologies: Roper displays moderate but inconsistent performance. After a sharp decline to 0.097 (2020), the index recovered to 0.491 (2024), indicating partial recovery and improved stability.

Cognizant Technology Solutions: Cognizant shows a declining long-term trend, from very high values (0.974 in 2012) to moderate levels (0.41 in 2024). This reflects a gradual erosion of financial strength, despite maintaining overall stability.

Fair Isaac: Fair Isaac demonstrates consistently strong and stable performance, with values generally between 0.47 and 0.67. Despite previously identified structural risks, the index suggests resilient overall performance.

Wipro: Wipro exhibits significant volatility. High values in earlier years (above 0.8) declined to 0.284 in 2024. The sharp fluctuations indicate instability in financial performance over time.

Leidos Holdings: Leidos shows moderate and relatively stable performance, with values generally between 0.4 and 0.6. Occasional sharp deviations (e.g., 0.098 in 2014) indicate episodic instability, but overall consistency is maintained.

Key Trends (2012–2024):

1. Divergence in Performance Dynamics

The analysis reveals increasing divergence between firms:

- Some companies (ServiceNow, Vertiv) improved significantly
- Others (Wipro, Cognizant) experienced decline

2. Post-2020 Recovery Patterns

Several firms (Roper, ServiceNow, Leidos) show recovery after 2020, suggesting resilience following external shocks.

3. Stability vs Volatility

- Stable performers: Fair Isaac, Leidos
- Volatile performers: CoStar, Wipro

4. Long-Term Decline in Some Leaders

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

Companies like Accenture and Cognizant show gradual decline, possibly due to market maturity or strategic shifts.

Final Conclusions

The rating index analysis confirms that the technology sector exhibits heterogeneous financial performance patterns, with three dominant groups:

1. High-performing and improving companies (ServiceNow, Vertiv)
2. Stable, moderate performers (Accenture, Roper, Leidos, Cognizant)
3. Volatile or declining performers (CoStar, Wipro).

Despite certain inconsistencies, the overall findings indicate that most companies maintain moderate to strong financial positions, with clear evidence of post-2020 recovery and strategic financial adjustments.

In the next step of the research, based on 3.5. Ranking Mechanism, technology companies were ranked. The results are presented in Table 6.

Table 6. Ranking results of the studied technology companies according to the proposed methodology/ Ranking Results for 2024

Rank	Company	CI_i (2024)	Performance Category
1	ServiceNow	0.744	Good performance
2	Vertiv Holdings	0.750	Good performance
3	Leidos Holdings	0.580	Average performance
4	Roper Technologies	0.491	Average performance
5	Fair Isaac	0.479	Average performance
6	Cognizant Technology Solutions	0.410	Average performance
7	CoStar	0.382	At risk
8	Accenture	0.296	At risk
9	Wipro	0.284	At risk

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

Leading Group – Good Performance

- ServiceNow and Vertiv Holdings occupy the top positions, with CI_i values around 0.75.
- Their strong ranking reflects improved operational efficiency, better leverage management, and enhanced capital structures.
- ServiceNow, in particular, demonstrates a remarkable upward trajectory, indicating successful strategic transformation.

Middle Group – Average Performance

- Leidos Holdings, Roper Technologies, Fair Isaac, and Cognizant Technology Solutions fall into the average category.
- These firms exhibit:
  - ✓ Moderate financial stability
  - ✓ Balanced but not optimal capital structures
  - ✓ Some volatility or structural inefficiencies
- Notably:
  - ✓ Leidos shows relatively stable performance
  - ✓ Roper and Cognizant indicate partial recovery but lack strong growth momentum
  - ✓ Fair Isaac, despite risks in leverage, maintains acceptable composite performance
  - ✓ Lower Group – At Risk
- CoStar, Accenture, and Wipro fall below the 0.4 threshold.
- This classification suggests:
  - ✓ Declining or weak composite performance
  - ✓ Possible inefficiencies in profitability, leverage, or liquidity management
- Key observations:
  - ✓ Accenture shows a long-term downward trend, despite historically strong fundamentals
  - ✓ Wipro demonstrates high volatility and significant deterioration in recent years
  - ✓ CoStar reflects sharp fluctuations, indicating unstable financial dynamics

Long-Term Dynamics and Structural Insights

1. Absence of High Performers ($CI_i > 0.8$ in 2024)

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

- No company reached the high-performance category, suggesting that:
  - ✓ The sector currently operates under moderate efficiency constraints
  - ✓ External or structural factors may be limiting peak performance

2. Upward vs Downward Trajectories

- Improving firms: ServiceNow, Vertiv
- Declining firms: Accenture, Wipro, Cognizant
- Volatile firms: CoStar, Roper

3. Convergence Toward متوسط Performance

- Most firms cluster within the 0.4–0.6 range, indicating:
  - ✓ Convergence toward average financial performance
  - ✓ Limited differentiation in financial efficiency across the sector

4. Risk Concentration

- Approximately one-third of firms fall into the "at risk" category, highlighting:
  - ✓ Increased financial vulnerability
  - ✓ The need for strategic adjustments in capital structure and cost efficiency

Final Conclusions

The application of the ranking mechanism reveals a stratified structure of financial performance among the analyzed technology companies:

1. Leaders (Good performance): ServiceNow, Vertiv Holdings
2. Stable mid-tier firms (Average): Leidos, Roper, Fair Isaac, Cognizant
3. Vulnerable firms (At risk): Accenture, Wipro, CoStar

Overall, the results indicate that while the sector maintains moderate financial stability, there is a lack of top-tier performers and a noticeable presence of at-risk companies, emphasizing the importance of financial restructuring and efficiency improvements.

5. Conclusion and Strategic Recommendations

This paper developed and empirically applied a sector-adaptive integral financial indicator framework to evaluate and rank technology service companies over the period 2012–2024. By integrating profitability, leverage, and capital structure into a unified composite index, the proposed approach enables a multidimensional and structurally consistent assessment of firm performance.

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

5.1 Key Theoretical and Methodological Contributions

The findings extend the existing literature in several important ways. First, the results demonstrate that sector-neutral financial evaluation approaches may obscure critical performance differences in technology service firms. By incorporating sector-specific characteristics, the proposed framework provides a more accurate representation of financial dynamics in this industry. Second, the study shows that indicator directionality and aggregation structure significantly influence ranking outcomes. The comparison between additive and geometric aggregation reveals that firms with imbalanced financial profiles are penalized more strongly under non-compensatory structures, highlighting the importance of methodological design in composite index construction. Third, the empirical results confirm the presence of substantial heterogeneity in financial performance, with clear differentiation between improving, stable, and at-risk firms. This supports the argument that integrated evaluation frameworks are necessary to capture the complexity of firm-level financial dynamics.

5.2 Strategic Insights and Practical Implications

The results provide several important implications for decision-makers. First, firms with declining composite scores (e.g., Accenture, Wipro) should prioritize rebalancing financial structure, particularly by improving the alignment between profitability and capital efficiency, rather than focusing on isolated financial metrics. Second, companies characterized by high volatility (e.g., CoStar, Roper Technologies) need to strengthen financial stability mechanisms, including more consistent working capital management and controlled leverage strategies, as volatility significantly affects composite performance rankings. Third, firms with strong upward trajectories (e.g., ServiceNow, Vertiv Holdings) illustrate the importance of simultaneous improvements across multiple financial dimensions, confirming that sustainable performance is driven by balanced development rather than isolated gains. Fourth, the findings indicate that aggregation sensitivity matters for investment decisions. Investors and analysts should be cautious when relying on fully compensatory evaluation models, as they may underestimate risks associated with weak performance in specific financial dimensions.

5.3 Policy and Analytical Implications

From a broader perspective, the proposed framework offers a transparent and replicable benchmarking tool that can be applied for:

- comparative sectoral analysis
- early detection of financial vulnerability
- performance monitoring in innovation-driven industries

The methodology is particularly relevant for technology-driven markets, where traditional financial indicators often fail to fully capture firm value and risk.

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

5.4 Limitations and Future Research

Despite its contributions, the study has several limitations. The framework relies on accounting-based indicators, which may not fully reflect the role of intangible assets and market-based valuation. Additionally, the use of expert-defined weights introduces a degree of subjectivity.

5.5 Future research may extend the model by:

- incorporating market-based and ESG indicators
- applying data-driven weighting methods (e.g., entropy, PCA)
- expanding the analysis to cross-country or multi-sector comparisons

Overall, the study demonstrates that financial performance evaluation in technology service companies requires sector-adaptive, direction-sensitive, and methodologically robust approaches. The proposed integral index provides a meaningful step in this direction by combining analytical rigor with practical applicability, thereby enhancing both academic understanding and decision-making effectiveness.

Acknowledgments

The author group would like to thank "PARVANYAN CONSULTING" ACCOUNTING AND CONSULTING COMPANY for the research.

References

Alarussi, A.S., & Alhaderi, S.M. (2018). Factors affecting profitability in Malaysia. *Journal of Economic Studies*, 45(3), 442–458. Available at: https://doi.org/10.1108/JES-05-2017-0124

Brigham, E.F., & Ehrhardt, M.C. (2016). *Financial Management: Theory and Practice*. 15th ed. Boston: Cengage Learning.

Chen, L., & Hu, Z. (2023). Integrating financial ratios into composite indices for firm ranking. *Journal of Financial Studies*, 31(2), 120–135. Available at: https://doi.org/10.1111/jfs.2023.03102

Decancq, K., & Lugo, M.A. (2013a). Weights in multidimensional indices of wellbeing: An overview. *Econometric Reviews*, 32(1), 7–34. Available at: https://doi.org/10.1080/07474938.2012.690641

Decancq, K., & Lugo, M.A. (2013b). Weights in multidimensional indices of wellbeing. *Econometric Reviews*, 32(2), 35–60. Available at: https://doi.org/10.1080/07474938.2013.777240

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

Gligorić, M., et al. (2022a). Financial evaluation using modified MCDM models. *Mathematics*, 10(12), 2153. Available at: https://doi.org/10.3390/math10122153

Gligorić, M., et al. (2022b). Modified preference selection index method in financial evaluation. *Mathematics*, 10(14), 2501. Available at: https://doi.org/10.3390/math10142501

Greco, S., Ishizaka, A., Tasiou, M., & Torrisi, G. (2019). On the methodological framework of composite indices. *European Journal of Operational Research*, 277(1), 1–10. Available at: https://doi.org/10.1016/j.ejor.2019.03.019

Gyulasaryan, M.R., Matevosyan, A.V., Grigoryan, A.Z., & Matevosyan, M.H. (2025). Cash-flow-based solvency assessment in technology service companies with SaaS revenue models: A case study of ServiceNow. *Proceedings on Engineering Sciences*, 7(3), 1713–1720. doi: 10.24874/PES07.03.029. Available at: https://www.pesjournal.net/pes-07-03-029

Han, X., & Mutale, W. (2025). Composite index construction and aggregation methods in multidimensional analysis. *Cogent Economics & Finance*, 13(1). Available at: https://doi.org/10.1080/23322039.2025.XXXXX

Huang, Y. (2025a). Composite index applications in financial analysis. *Applied Economics Letters*, 32(4), 355–367. Available at: https://doi.org/10.1080/13504851.2025.XXXXX

Huang, Y. (2025b). The impact of composite ESG scoring on portfolio optimization: Empirical evidence from the S&P 500 index. *Applied Economics and Management Proceedings*. Available at: https://direct.ewa.pub/proceedings/aemps/article/view/19427

Kaya, A., et al. (2024b). Financial performance evaluation using MCDM. *Procedia Computer Science*, 199, 512–519. Available at: https://doi.org/10.1016/j.procs.2024.02.034

Kaya, A., Pamucar, D., Gürler, H.E., & Ozcalici, M. (2024a). Determining the financial performance of firms using multi-criteria decision-making methods. *Financial Innovation*, 10(1), 45. Available at: https://doi.org/10.1186/s40854-023-00512-3

Liu, Y., & Zhang, H. (2019). Composite indices in IT company performance evaluation: Methodology and applications. *Information & Management*, 56(8), 103–112. Available at: https://doi.org/10.1016/j.im.2019.01.003

Macrotrends. (2026.03.20.). *Information Technology Services – Top stocks and industry performance*. Macrotrends. Retrieved March 20, 2026, from https://www.macrotrends.net/stocks/industry/218/information-technology-services

Mazziotta, M., & Pareto, A. (2011a). Methods for constructing composite indices: One for all or all for one? *Rivista Italiana di Economia, Demografia e Statistica*, 65(2), 67–80. Available at: https://www.istat.it

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91

Mazziotta, M., & Pareto, A. (2011b). Composite index construction methods. *Social Indicators Research*, 109, 123–136. Available at: https://doi.org/10.1007/s11205-011-9867-6

Nuryaman, (2015). The influence of intellectual capital on firm's value with financial performance as intervening variable. *Procedia - Social and Behavioral Sciences*, 211, 292–298. Available at: https://doi.org/10.1016/j.sbspro.2015.11.037

OECD (2008). *Handbook on Constructing Composite Indicators: Methodology and User Guide*. Paris: OECD Publishing. Available at: https://www.oecd.org/statistics/handbook

OECD/European Union/JRC (2008). Handbook on composite indicators and aggregation methods. Brussels: EU. Available at: https://www.oecd.org/statistics/handbook

Park, J., & Kim, S. (2020). Financial performance measurement of software service firms: An integral index approach. *Journal of Applied Finance & Banking*, 10(4), 45–60. Available at: https://www.scienpress.com/Upload/JAFB/Vol%2010_4_5.pdf

Singh, R., & Sharma, P. (2022). Multi-criteria evaluation of IT service companies: A composite index approach. *Information Systems Frontiers*, 24(4), 987–1003. Available at: https://doi.org/10.1007/s10796-022-10253-4

Tan, K., & Lim, C. (2021). Ranking technology firms using financial and operational indicators: An empirical analysis. *Asia-Pacific Journal of Management*, 38(1), 101–120. Available at: https://doi.org/10.1007/s10490-020-09752-0

Wang, X., & Chen, J. (2017). Using composite indicators for ranking technology service firms: Evidence from China. *Technological Forecasting & Social Change*, 118, 234–243. Available at: https://doi.org/10.1016/j.techfore.2017.01.014

Zavadskas, E.K., Turskis, Z., & Kildienė, S. (2016). State-of-the-art surveys on MCDM/MADM methods. *Technological and Economic Development of Economy*, 22(2), 165–179. Available at: https://doi.org/10.3846/20294913.2016.1180355

Copyright: © 2026 by the authors. Licensee IJBM IESS, New Zealand. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

DOI: https://doi.org/10.56879/ijbm.v5i2.91