Journal of ECONOMICS International Scientific Journal
June 2026, Volume: 3, Issue: 2, pp. 34–39
DOI: https://doi.org/10.36719/3104-4727/7/34-39

Multi-Criteria Decision Making and Strategic Decision Qualityin Management: An Integrated AHP-TOPSIS Approach

Farahim Hajiyev

Abstract. *This article examines the role of multi-criteria decision making in improving strategic management decisions under uncertainty, competing priorities, and institutional risk. The study focuses on the integrated use of the Analytic Hierarchy Process and TOPSIS as a decision-support framework for strategic investment evaluation. The central argument is that managerial choices cannot be justified only through intuition or a single financial indicator, because real strategic alternatives must be assessed through return, risk, liquidity, strategic fit, capital requirement, and regulation or compliance at the same time. The scientific novelty of the article lies in adapting the AHP-TOPSIS logic to a strategic decision problem in the Azerbaijani financial sector and presenting it in a transparent article format. The findings show that risk is the dominant criterion in the decision hierarchy, while expected return and strategic fit follow as important supporting priorities. The TOPSIS results indicate that the most appropriate alternative is the one with the most balanced performance across all criteria, not simply the alternative with the highest isolated return. The article concludes that MCDM methods can strengthen decision quality by making managerial priorities measurable, consistent, and easier to defend.*

Keywords: *multi-criteria decision making, AHP, TOPSIS, strategic management, investment decision, decision quality, Azerbaijan financial sector*

Introduction

Contemporary organizations operate in an environment where management decisions are increasingly affected by uncertainty, regulatory pressure, scarce resources, and the need to balance short-term performance with long-term sustainability. In such conditions, strategic decisions become difficult because managers must compare alternatives that do not perform equally across all evaluation dimensions. An investment option may promise a high return, but it may also involve excessive risk, weak liquidity, or a compliance burden. Another option may be less profitable but more stable, easier to implement, and more consistent with institutional strategy. This complexity shows why modern management needs structured analytical tools rather than purely intuitive judgment (Belton & Stewart, 2002; Goodwin & Wright, 2014). Multi-Criteria Decision Making methods are especially relevant for this type of problem because they allow decision makers to evaluate several criteria simultaneously and to convert expert judgments into a traceable decision logic.

Azerbaijan State University of Economics UNEC Graduate School, Master's student, Baku, Azerbaijan
E-mail: hajiyevfarahim@gmail.com
Received: 2 February 2026; Accepted: 6 April 2026; Published online: 14 June 2026

Within the broad MCDM family, AHP and TOPSIS are among the most widely used approaches. AHP helps determine the relative importance of criteria through pairwise comparisons, while TOPSIS ranks alternatives according to their closeness to the ideal solution and distance from the negative ideal solution. When these methods are integrated, they create a practical framework for strategic evaluation: priorities are first measured, then alternatives are ranked according to these priorities (Saaty, 1992; Hwang & Yoon, 1981).

Research

The research is based on a strategic investment decision scenario reflecting the logic of management practice in the Azerbaijani financial sector. Because financial institutions operate under risk-sensitive and compliance-oriented conditions, the decision model was structured around six criteria: expected return, risk level, liquidity, strategic fit, capital requirement, and regulation/compliance impact. These criteria were selected because they jointly represent both financial attractiveness and institutional suitability. The model therefore avoids a narrow view of strategy and treats decision quality as the outcome of a balanced multi-dimensional assessment (Mardani et al., 2015; Zavadskas et al., 2014).

Table 1
Strategic investment criteria and evaluation directions

Criterion	Direction	Evaluation logic
K1 Expected return	Benefit	Higher expected return increases financial attractiveness.
K2 Risk level	Cost	Lower risk is preferred because it reduces uncertainty and potential loss.
K3 Liquidity	Benefit	Higher liquidity supports flexibility and faster resource conversion.
K4 Strategic fit	Benefit	Higher alignment strengthens consistency with organizational priorities.
K5 Capital requirement	Cost	Lower capital need reduces resource pressure and opportunity cost.
K6 Regulation/compliance	Benefit	Higher compliance quality improves governance and regulatory soundness.

Source: Compiled by the author based on the MCDM application model.

The criteria in Table 1 show that the decision problem contains both benefit and cost dimensions. This distinction is essential for the TOPSIS stage because the ideal solution is not defined by maximizing every indicator. Some criteria, such as return and compliance, should be maximized, whereas risk and capital requirement should be minimized. In management practice, this logic reflects the real nature of strategic choices, where a strong alternative must combine opportunity with control (Triantaphyllou, 2000; Zavadskas &Turskis, 2011).

Table 2

AHP results: criteria weights in the strategic decision model

Criterion	Weight (w_i)	Percentage
K2 Risk level	0.4226	42.26%
K1 Expected return	0.1908	19.08%
K4 Strategic fit	0.1908	19.08%
K6 Regulation/compliance	0.0889	8.89%
K3 Liquidity	0.0704	7.04%
K5 Capital requirement	0.0365	3.65%
Total	1.0000	100%

Source: Compiled by the author based on the AHP pairwise comparison results.

The AHP results indicate that risk is the most influential criterion in the modeled decision hierarchy. This outcome is consistent with the nature of strategic financial decisions, where uncertainty and possible loss often shape managerial preferences more strongly than return alone. Expected return and strategic fit receive equal weights, which means that financial performance and long-term institutional alignment are treated as complementary priorities. The lower weight of capital requirement does not imply that resource use is irrelevant; rather, it shows that decision makers in the modeled scenario give greater importance to strategic security and risk control than to the isolated cost of capital (Saaty, 1992; Guitouni& Martel, 1998).

Table 3

AHP consistency test results

Metric	Value	Interpretation
Number of criteria (n)	6	Six decision criteria were compared.
Maximum eigenvalue (λmax)	6.1980	Close to n, indicating acceptable comparison structure.
Consistency index (CI)	0.0396	Low internal inconsistency.
Random index (RI)	1.24	Standard RI value for n = 6.
Consistency ratio (CR)	0.0319	CR < 0.10, therefore judgments are acceptable.

Source: Compiled by the author based on the AHP consistency calculation.

The consistency ratio confirms that the pairwise comparisons are logically acceptable. This point is important because AHP does not remove human judgment from management decisions; instead, it organizes and tests that judgment. When the consistency ratio remains below the generally accepted threshold of 0.10, the resulting weights may be used in the next stage with greater confidence. In this sense, consistency analysis acts not only as a mathematical control but also as a managerial discipline mechanism, encouraging decision makers to review priorities when contradictions appear (Saaty, 1992; Goodwin & Wright, 2014).

Table 4
TOPSIS decision matrix used for ranking strategic alternatives

Alternative	K1 Return	K2 Risk	K3 Liquidity	K4 Fit	K5 Capital	K6 Compliance
A1	70	30	85	60	40	90
A2	65	35	75	70	50	85
A3	90	80	60	80	70	70
A4	80	50	70	75	55	80

Source: Compiled by the author based on the TOPSIS scenario calculations.

The decision matrix presents four alternatives evaluated under the same six criteria. Alternative A3 has the highest return value, but it also has the highest risk and capital requirement. This demonstrates why a one-dimensional return-based ranking would be misleading. The TOPSIS method is useful precisely because it considers the entire profile of each alternative and evaluates whether high performance in one dimension is balanced by acceptable performance in the others (Hwang & Yoon, 1981; Koksalan et al., 2011).

Table 5
TOPSIS final results: relative closeness coefficients and ranking

Rank	Alternative	Relative closeness (C_i)	Managerial interpretation
1	A1	0.8474	Best balanced profile with low risk and strong liquidity/compliance.
2	A2	0.8205	Close to the leading option; strong strategic fit and acceptable risk.
3	A4	0.6011	Moderate option with balanced but weaker ideal closeness.
4	A3	0.1683	High return is outweighed by high risk and capital requirement.

Source: Compiled by the author based on the TOPSIS ranking results.

The final TOPSIS ranking shows that A1 is the most suitable alternative, followed closely by A2. The most important managerial implication is that the best option is not necessarily the alternative with the highest return. A3, despite its strong return value, ranks last because its risk and capital requirement are unfavorable under the weighted decision logic. This result supports the main argument of the article: strategic management decisions require balanced evaluation, and MCDM methods provide a transparent way to justify that balance (Mardani et al., 2015; Zavadskas et al., 2014).

The integrated AHP-TOPSIS framework also strengthens the accountability of board-level and committee-level decisions. AHP makes it possible to explain why one criterion receives more importance than another, while TOPSIS explains why one alternative is preferred in the final ranking. Together, the two methods create a chain of reasoning from managerial priorities to measurable decision outcomes. Such a framework is valuable in financial organizations because investment choices must be defensible not only internally but also in relation to compliance, governance, and stakeholder expectations (Belton & Stewart, 2002; Sharda, Delen, & Turban, 2021).

However, the application of MCDM in organizations should not be treated as a mechanical exercise. The quality of the result depends on the relevance of criteria, the reliability of data, the competence of experts, and the neutrality of the evaluation process. Incomplete data can distort alternative scores, while decision-maker bias can affect pairwise comparisons. Therefore, successful implementation requires a clear decision problem, transparent criterion definitions, updated data sources, and sensitivity analysis to test whether the ranking changes under different weighting assumptions (Liu et al., 2019; Siksnelyte-Butkiene et al., 2020).
From a practical perspective, the model can be adapted for investment committees, project prioritization, supplier selection, technology adoption, risk-based portfolio evaluation, and other strategic decisions. Its main advantage is that it transforms dispersed managerial opinions into an organized analytical structure. At the same time, the model remains understandable enough for practitioners because the logic of weighting and ranking can be communicated through tables, coefficients, and criterion explanations rather than through overly abstract formulas.

Conclusion

The study shows that multi-criteria decision-making methods are effective tools for improving strategic decision quality in management. In complex organizational environments, decisions are rarely based on one criterion, and alternatives usually involve trade-offs among return, risk, liquidity, strategic fit, capital requirement, and compliance. The integrated AHP-TOPSIS framework used in this article makes these trade-offs visible and measurable. AHP identifies the relative importance of criteria, while TOPSIS transforms those weighted priorities into a final ranking of alternatives.

The results demonstrate that risk is the dominant criterion in the modeled strategic investment decision, followed by expected return and strategic fit. This finding reflects a prudent management logic in which stability, uncertainty control, and institutional alignment are prioritized together with financial attractiveness. The consistency result confirms that the criterion weights are logically acceptable, while the TOPSIS ranking shows that the strongest alternative is the one with the most balanced profile rather than the highest isolated return.

On the basis of the research results, the following recommendations can be proposed:
1. Organizations should define decision problems clearly before applying any MCDM model.
2. Criteria should be selected according to strategic relevance, measurability, and comparability.
3. AHP should be used to make managerial priorities explicit and to test consistency in judgments.
4. TOPSIS should be applied when alternatives need to be ranked according to balanced overall performance.
5. Decision makers should check the sensitivity of results when criterion weights or scores change.
6. Financial institutions should integrate MCDM logic into governance, risk, and investment committee procedures.

References

1. Belton, V., & Stewart, T. J. (2002). *Multiple criteria decision analysis: An integrated approach.* Kluwer Academic Publishers.
2. Büyüközkan, G., &Güleryüz, S. (2016). *An integrated DEMATEL-ANP approach for renewable energy resources selection in Turkey.* International Journal of Production Economics, 182, 435-448.
3. Effatpanah, S. K., Ahmadi, M. H., Aungkulanon, P., Maleki, A., Sadeghzadeh, M., Sharifpur, M., & Chen, L. (2022). *Comparative analysis of five widely-used multi-criteria decision-making methods to evaluate clean energy technologies*. Sustainability, 14(3), 1403.

4. Goodwin, P., & Wright, G. (2014). *Decision analysis for management judgment* (5th ed.). John Wiley & Sons.
5. Guitouni, A., & Martel, J. M. (1998). *Tentative guidelines to help choosing an appropriate MCDA method.* European Journal of Operational Research, 109(2), 501-521.
6. Hwang, C. L., & Yoon, K. (1981). *Multiple attribute decision making: Methods and applications.* Springer-Verlag.
7. Kaya, O., Tortum, A., Alemdar, K. D., &Codur, M. Y. (2020). *Site selection for electric vehicle charging stations in Istanbul by GIS and multi-criteria decision making.* Transportation Research Part D, 80, 102271.
8. Kilic, H. S., Zaim, S., &Delen, D. (2015). *Selecting the best ERP system for SMEs using a combination of ANP and PROMETHEE methods.* Expert Systems with Applications, 42(5), 2343-2352.
9. Koksalan, M., Wallenius, J., &Zionts, S. (2011). *Multiple criteria decision making: From early history to the 21st century.* World Scientific.
10. Liu, H. C., Chen, X. Q., Duan, C. Y., & Wang, Y. M. (2019). *Failure mode and effect analysis using multi-criteria decision-making methods: A systematic literature review.* Computers & Industrial Engineering, 135, 881-897.
11. Mardani, A., Jusoh, A., Nor, K. M. D., Khalifah, Z., Zakwan, N., &Valipour, A. (2015). *Multiple criteria decision-making techniques and their applications: A review of the literature from 2000 to 2014.* Economic Research-EkonomskaIstraživanja, 28(1), 516-571.
12. Pasaoglu, G., Pardo Garcia, N., &Zubi, G. (2018). *A multi-criteria and multi-expert decision aid approach to evaluate the future Turkish power plant portfolio.* Energy Policy, 119, 654-665.
13. Saaty, T. L. (1992). *The analytic hierarchy process: Planning, priority setting, resource allocation*. McGraw-Hill.
14. Sharda, R., Delen, D., & Turban, E. (2021). *Analytics, data science, & artificial intelligence: Systems for decision support.* Pearson.
15. Siksnelyte-Butkiene, I., Zavadskas, E. K., &Streimikiene, D. (2020). *Multi-criteria decision making for the assessment of renewable energy technologies in a household: A review*. Energies, 13(5), 1164.
16. Triantaphyllou, E. (2000). *Multi-criteriadecision making methods: A comparative study.*Springer.
17. Zavadskas, E. K., Turskis, Z., &Kildiene, S. (2014). *State of art surveys of overviews on MCDM/MADM methods.* Technological and Economic Development of Economy, 20(1), 165-179.