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An integrated strategic benchmarking model for assessing international alliances with application to NATO membership enlargement

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Abstract

Purpose – Promoting security, stability and cooperation is the *raison d'être* of the North Atlantic Treaty Organization (NATO) and these are the aims of its strategy of membership enlargement. The incentive of NATO membership has led some former Warsaw Pact applicant countries to reform their political systems, transform their economies, deal with corruption and improve social justice and human rights. However, controversy has surrounded NATO's enlargement because of the current ambiguous and subjective decision-making process and the effect that it could have on the organization. This paper aims to present the results of a study to develop a benchmarking model as a means to assist NATO evaluate and screen potential applicant countries.

Design/methodology/approach – A novel and structured multiple-criteria decision analysis model that considers specific NATO applicant evaluation criteria and environmental forces is offered and a template for a membership evaluation process is proposed. A total of 120 researchers in France, Germany, Switzerland and the USA provided the necessary data on the 23 countries that are analyzed in order to develop the benchmarking model. Four distinct categories were established to categorize these countries. The ranking of the countries based on Euclidean distance from the ideal state is illustrated with a classification schema outlining four typologies as beneficial believers, detrimental disadvantaged, perilous partners and apathetic acquaintances.

Findings – Among the potential applicant countries considered as "beneficial believers" are Sweden, Austria, Switzerland, Finland and Ireland while other countries, such as, Kazakhstan, Azerbaijan, Uzbekistan, Turkmenistan, Georgia, Montenegro, Kyrgyzstan and Tajikistan are considered as "detrimental disadvantaged". Furthermore, Russia and Ukraine were identified as "perilous partners" and Malta, FYR Macedonia, Cyprus, Serbia, Belarus, Bosnia and Herzegovina, Armenia and Moldova were identified as "apathetic acquaintances".

Practical implications – This model could be applied to other supranational organizations and multinational firms when assessing international strategic alliances.

Originality/value – The paper presents the results of a study to develop a benchmarking model as an aid in evaluating and screening potential NATO applicant countries.

Keywords Benchmarking, Analytic hierarchy process, International organizations, Decision making, Strategic alliances

Paper type Research paper

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1. Introduction

The North Atlantic Treaty Organization (NATO) is an alliance of democratic countries that was founded in 1949 as an intergovernmental political organization and which later grew into a structure of member states to safeguard the freedom and security of its members by political and military means. It also advances the ideals of democracy, individual liberty and the rule of law. During the last 20 years, a new Europe has emerged and this has focused NATO on enlarging membership and strengthening the Euro-Atlantic alliance. Through six rounds of enlargement, NATO's membership has increased from 12 to its current 28 countries. NATO membership enlargement decisions are driven by promoting stability and cooperation while preserving common values. Applicant countries engage in an intensified dialogue with NATO about their membership aspirations and related reforms. The applicant countries should consent to further the principles of NATO and must also demonstrate their ability to meet the obligations and commitments of possible future membership. The requirements a country must fulfill to seek NATO membership are a functioning democratic political system based on a regular market economy, the fair treatment of minority populations, a commitment to the peaceful resolution of conflicts, the ability and willingness to make a military contribution to NATO operations and a commitment to democratic civil-military relations and institutional structures.

A NATO study in 1995 concluded that enlargement of the alliance would contribute to enhanced stability and security for all countries in the Euro-Atlantic area by encouraging and supporting democratic reforms, including the establishment of civilian and democratic control over military forces; fostering patterns and habits of cooperation, consultation and consensus-building characteristic of relations among members of the alliance; and promoting cooperative and supportive relations. The enlargement would also increase transparency in defense planning and military budgets, thereby reinforcing confidence among states, and would reinforce the overall tendency toward closer integration and cooperation in Europe (Hartley, 2010). The study also concluded enlargement would strengthen the alliance's ability to contribute to international security and strengthen and broaden the transatlantic partnership. Ultimately, allies will decide by consensus whether to extend membership to an applicant country. There have been dissenters from this perspective and they argue that enlargement could dilute the security aspects and efficacy of NATO.

New member countries, particularly those from the Community of Independent States that were formerly closely allied to the former Soviet Union as members of the Warsaw Pact, could become entangled either militarily or politically with Russia, the pivotal country in the former Soviet Union and in the Warsaw Pact, and consequently, lessen the security for all of NATO's membership (Sandler and Hartley, 2001). NATO's military capability could be diminished because with enlargement here is an increased financial risk and enlarged membership could also dilute NATO's military capacity and regional security efficacy instead of increasing burden sharing (Hartley and Sandler, 1999).

Despite the intense negotiations and reform required for membership, controversy has surrounded NATO's enlargement because of the current ambiguous and subjective decision-making process (Sandler and Hartley, 1999). The issues are complex and decisions are based on criteria that consider both qualitative and quantitative dimension and, therefore, require more formal objective-based decision processes. Multiple-criteria

decision analysis (MCDA) methods provide a formal framework for information exchange among the decision makers (DMs) thus enhancing and structuring the decision-making process. Ultimately, the decision to admit applicant countries is the domain of existing member countries and an MCDA contributes efficaciously to the process and supports and permits DMs to explore their value system from multiple viewpoints and modify their often preconceived perceptions by obtaining knowledge of the other group members' preference structure and beliefs. However, there is a natural impediment to efficacious and effective decision making in that DMs come from many different countries with different biases and desired outcomes thereby transforming the process into a multi-faceted consensual process despite this instrument. The following section presents the conceptual MCDA framework used in this study followed by a detailed explanation of the mathematical model and procedure in Section 3. Section 4 presents the results of the pilot study and Section 5 presents our conclusions and future research directions.

2. The conceptual framework

A number of decision methodologies in the group decision-making context have been presented in the MCDA literature. A comprehensive survey can be found in Hwang and Lin (1987). Iz and Gardiner (1993) review formal group decision-making models and describe some examples of conceptual frameworks and actual implementations of group decision-making models. A comprehensive collection of research devoted to synthesis and analysis of group support frameworks and procedures can be found in Jessup and Valacich (1993). When facing such multiple-criteria issues, the literature and research show that the following difficulties may be encountered:

- DMs often use verbal expressions and linguistic variables for subjective judgments that lead to ambiguity (Poyhonen *et al.*, 1997). Furthermore, the subjective assessment process is intrinsically imprecise and may involve two types of judgments: comparative judgment and absolute judgment (Saaty, 2006).
- DMs often provide imprecise or vague information due to lack of expertise, unavailability of data, or time constraint (Kim and Ahn, 1999).
- Meaningful and robust aggregation of subjective and objective judgments affects the evaluation process (Valls and Torra, 2000).

A decision may not be appropriately made without fully considering its context and all criteria in an MCDA (Belton and Stewart, 2002; Yang and Xu, 2002). Recently, MCDA researchers have focused on models to integrate the intuitive preferences of multiple DMs into structured and analytical frameworks (Bailey *et al.*, 2003; Costa *et al.*, 2003; Hsieh *et al.*, 2004; Liesiö *et al.*, 2007; Tavana, 2006). MCDA requires the determination of weights that reflect the relative importance of various competing criteria. These criteria are outlined in Table I. Several approaches such as point allocation, paired comparisons, trade-off analysis and regression estimates could be used to specify these weights (Kleindorfer *et al.*, 1993).

We use the analytic hierarchy process (AHP) developed by Saaty (1977) to estimate the important weight of the criteria. The process is simplified by confining the estimates to a series of pairwise comparisons. The measure of inconsistency provided by the AHP allows for the examination of inconsistent priorities. One of the advantages of the AHP is that it encourages DMs to be consistent in their pairwise comparisons.

Opportunities	Threats
Armed forces personnel (thousands)	Arms imports (millions)
Education and health expenditure spending (percentage of gross domestic product (GDP))	Budget deficit (billions)
Electricity production	Corruption index
Exports of goods/services (percentage of GDP)	Electrical outages (days)
Freedom of the press	Energy consumption
Military expenditures (percentage of GDP)	Foreign debt
Natural gas reserves	Imports of goods/services (percentage of GDP)
Number of airports	Inflation rate
Oil reserves and production (bbl/day)	Ethnic disputes
Police force (thousands)	Nuclear weapons
Railways and waterways (km)	Oil/gas imports
Telephone connection per 1,000	Political violence
Total renewable water resources	Public debt (percentage of GDP)
Weapon holdings (thousands)	Terrains and natural obstacles

Table I.
Selected criteria for membership application

Saaty (1990b) suggests a measure of consistency for the pairwise comparisons. When the consistency ratio is unacceptable, the DMs become aware that their pairwise comparisons are logically inconsistent, and they are prompted to revise them. The AHP has been a very popular technique for determining weights in MCDA (Ho, 2008; Vaidya and Kumar, 2006; Saaty and Sodenkamp, 2008). Another advantage of the AHP is its capability to value criteria and to scale them discriminately using a procedure that measures the consistency of these scale values (Saaty, 1989).

There has, though, been some criticism of the AHP in the operations research literature. Harker and Vargas (1987) show that the AHP does have an axiomatic foundation; the cardinal measurement of preferences is fully represented by the eigenvector method; and the principles of hierarchical decomposition and rank reversal are valid. Conversely, Dyer (1990b) has questioned the theoretical basis underlying the AHP and argues that it can lead to preference reversals rather than the best or preferential outcome. In response, Saaty (1990a) explains how rank reversal is a positive feature when new reference points are introduced. In this study, the geometric aggregation rule is used to avoid the controversies associated with rank reversal (Dyer, 1990a, b; Harker and Vargas, 1990; Saaty, 1990a).

MCDA requires the ranking of a finite set of alternatives in terms of a finite number of conflicting decision criteria. More often, these conflicting decision criteria can be grouped into contradictory categories. Higher scores are preferred for positive criteria and lower scores are preferred for negative criteria. The classification of different criteria is a delicate part of the problem formulation because all different aspects of the problem must be represented while avoiding redundancies (Bouyssou, 1990). Roy and Bouyssou (1987) have developed a series of operational tests that can be used to check the consistency of this classification. In practice, two aggregation techniques are used to compute two aggregated indexes and evaluate the alternatives when criteria are divided binomially. The first approach is the opportunities to threat ratio approach (Tavana and Banerjee, 1995) and the second is the opportunities minus threats approach (Tavana, 2004). The former approach is a ratio scale and the latter approach is an interval scale.

Among the many templates applicable to analyzing the political, economic, social, technological, environmental and legal (PESTEL) impacts on decisions is the PESTEL analysis. This is an appropriate model to determine opportunities and threats from NATO membership enlargement and to analyze the macro environment of applicant countries and it also allows an organization, such as NATO, to determine the relevant macro-politico-socio-economic criteria that impact on their decisions (Johnson *et al.*, 2006). These criteria are complex and must be incorporated in a strategy that involves entering a new geographic zone. Such an analysis would enhance the decision-making process. A PESTEL analysis is an environmental scanning process that may be applied to encapsulate the most appropriate criteria for assessing applicant countries for NATO membership and may be used in combination with other relevant assessment techniques.

For the purposes of categorizing and weighting membership criteria and environmental forces in this study, opportunities and threats are determined for each of the criteria and are combined with a PESTEL analysis and with an AHP. The final categories determined are labeled either opportunity or threat. The method proposed is a weighted-sum MCDA model with conflicting combined binomial criteria of opportunity and threat depending on the perspective of NATO and the perspective of the applicant country. That is, an opportunity categorization for an applicant country for NATO may be positive in peace time and negative in a conflict. Furthermore, a positive criterion for a particular applicant country may be a negative criterion for NATO.

Triantaphyllou (2000) has discussed the mathematical properties of weighted-sum MCDA models. Many weighted-sum models have been developed to help DMs deal with the strategy evaluation process (Gouveia *et al.*, 2008; Leyva-Lopez and Fernandez-Gonzalez, 2003). Triantaphyllou and Baig (2005) have examined the use of four important weighted-sum MCDA methods when advantages and disadvantages, corresponding to opportunities and threats, are used as conflicting criteria. They compared the simple weighted-sum model, the weighted-product model and the AHP along with some of its variants, including the multiplicative AHP. Their extensive empirical analysis revealed some ranking inconsistencies among the four methods, especially, when the number of alternatives was high. Although they were not able to show which method results in the appropriate classification, they did prove multiplicative AHP is immune to ranking inconsistencies.

The weighted-sum scores in this model are used to compare potential candidate countries among themselves and with the ideal state. The concept of ideal state, an unattainable idea, serving as a norm or rationale facilitating human choice problem is not new (Tavana, 2002). The seminal work of Schelling (1960) introduced the concept. Subsequently, Festinger (1964) showed that an external, generally non-accessible choice assumes the important role of a point of reference against which choices are measured. Zeleny (1974, 1982) demonstrated how the highest achievable scores on all currently considered decision criteria form this composite ideal choice. As all choices are compared, those closer to the ideal are preferred to those farther away. Zeleny (1982) shows that the Euclidean measure can be used as a proxy measure of distance.

3. The mathematical model and notations

We propose a novel and structured MCDA model that considers specific NATO membership criteria and environmental forces and which may be used as a supporting

decision-making improvement instrument and provides a template for the evaluation of countries application for membership.

Let us define:

- n Number of potential applicant states.
- m Number of opportunities.
- l Number of threats.
- x_{ij} Score of opportunity j on state i.
- y_{ij} Score of threat j on state i.
- $\bar{x}_{\mathrm{ij}}$ Normalized score of opportunity j on state i.
- $\bar{y}_{\mathrm{ij}}$ Normalized score of threat j on state i.
- wo_j Importance weight of opportunity j $\left(\sum_{j=1}^{m} wo_j = 1\right)$.
- w_{tj} Importance weight of threat j $\left(\sum_{j=1}^{l} wt_j = 1\right)$.
- $\tilde{x}_{ij}$ Normalized weighted score of opportunity j.
- $\tilde{y}_{ij}$ Normalized weighted score of threat j.

We normalize the opportunity scores using the following normalization process:

$$\hat{x}_j = \mathrm{Min}(x_{ij};\ \ i = 1, \ldots, n;\ \ j = 1, \ldots, m) \tag{1}$$

$$\hat{\hat{x}}_j = \mathrm{Max}(x_{ij};\ \ i = 1, \ldots, n;\ \ j = 1, \ldots, m) \tag{2}$$

and the normalized opportunity score ($\bar{x}_{ij}$) is:

$$\bar{x}_{ij} = \frac{x_{ij} - \hat{x}_j}{\hat{\hat{x}}_j - \hat{x}_j} \tag{3}$$

Similarly, we normalize the threat scores using the following normalization process:

$$\hat{y}_j = \mathrm{Min}(y_{ij};\ \ i = 1, \ldots, n;\ \ j = 1, \ldots, l) \tag{4}$$

$$\hat{\hat{y}}_j = \mathrm{Max}(x_{ij};\ \ i = 1, \ldots, n;\ \ j = 1, \ldots, l) \tag{5}$$

and the normalized threat score ($\bar{y}_{ij}$) is:

$$\bar{y}_{ij} = \frac{y_{ij} - \hat{y}_j}{\hat{\hat{y}}_j - \hat{y}_j} \tag{6}$$

Next, we find the weighted normalized opportunity and threat scores:

$$\tilde{x}_{ij} = \bar{x}_{ij}.wo_j \tag{7}$$

$$\tilde{y}_{ij} = \bar{y}_{ij}.wt_j \tag{8}$$

We then find the average normalized score of the opportunities ($\tilde{\bar{x}}_i$):

$$\tilde{\bar{x}}_i = \frac{\sum_{j=1}^{m} \tilde{x}_{ij}}{m} \quad (i = 1, \ldots, n;\ j = 1, \ldots, m) \tag{9}$$

and the average normalized score of the threats ($\tilde{\bar{y}}_i$):

$$\tilde{\bar{y}}_i = \frac{\sum_{j=1}^{l} \tilde{y}_{ij}}{l} \quad (i = 1, \ldots, n;\ j = 1, \ldots, l) \tag{10}$$

The overall average score of the opportunities ($\tilde{\bar{X}}$) is:

$$\tilde{\bar{X}} = \frac{\sum_{i=1}^{n} \tilde{\bar{x}}_i}{n} \quad (i = 1, \ldots, n) \tag{11}$$

and the overall average score of the threats ($\tilde{\bar{Y}}$) is:

$$\tilde{\bar{Y}} = \frac{\sum_{i=1}^{n} x\bar{y}_i}{n} \quad (i = 1, \ldots, n) \tag{12}$$

As shown in Figure 1, the overall average opportunity and threat scores divide the graph into four quadrants with a classification schema outlining four typologies as beneficial believers, detrimental disadvantaged, perilous partners and apathetic acquaintances.

The applicant state i is considered a beneficial believer if $\tilde{\bar{x}}_i \geq \tilde{\bar{X}}$ and $\tilde{\bar{y}}_j < \tilde{\bar{Y}}$, an applicant country is considered as being detrimentally disadvantaged if $\tilde{\bar{x}}_i < \tilde{\bar{X}}$ and $\tilde{\bar{y}}_j \geq \tilde{\bar{Y}}$, a perilous partner if $\tilde{\bar{x}}_i \geq \tilde{\bar{X}}$ and $\tilde{\bar{y}}_j \geq \tilde{\bar{Y}}$ and an apathetic acquaintance if $\tilde{\bar{x}}_i < \tilde{\bar{X}}$ and $\tilde{\bar{y}}_j < \tilde{\bar{Y}}$. Each quadrant has specific attributes and countries are represented by coordinates based on the values of the axes, that is, the opportunity score or threat score. Those countries that have scores that are greater than the mean on the opportunity score axis may be considered as favorable and an opportunity and the countries with scores less than the mean on the threat score axis may also be considered favorable though a threat:

- *Beneficial believers*. In this quadrant, the applicant country's opportunities outweigh its threats. This quadrant represents the greatest potential for NATO in terms of potential for alliance and a country represented in this quadrant should be seriously considered.
- *Detrimental disadvantaged*. For those countries in this quadrant, its threats surpass its opportunities. A country in this quadrant provides few opportunities but a great deal of threats to NATO. The detrimental disadvantaged should be avoided as the risks far outweigh the potential benefits.
- *Perilous partners*. A country in this quadrant brings both significant opportunities and threats to NATO. This is the highest risk quadrant and requires an in-depth analysis of the tradeoff between the opportunities and threats. These countries could be very detrimental to NATO in the long run, although they could also provide a great deal of opportunities.
- *Apathetic acquaintances*. Countries represented in this quadrant provide very few opportunities and are a very low threat to NATO. There is low risk in these

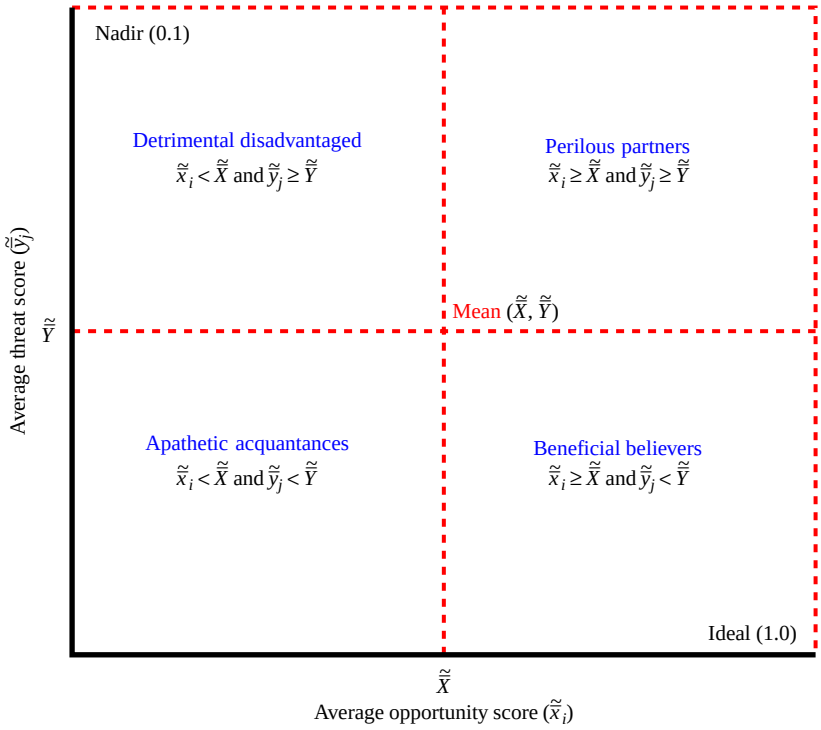

Figure 1.
The categorization model

countries applying for membership of NATO and there is not much to be gained from an alliance.

Finally, we calculate the overall distance of each alternative from the ideal state (1,0) as:

$$D_i = \sqrt{(\tilde{\tilde{x}}_i - 1)^2 + (\tilde{\tilde{y}}_i - 0)^2} \tag{13}$$

The Euclidean distance is used to rank an alternative. Alternatives closer to the ideal state ($\tilde{\tilde{x}}_i = 1;\ \tilde{\tilde{y}}_j = 0$) are preferred to those farther away from the ideal state. Once the model is developed, sensitivity analyses can be performed to determine the impact on the ranking of states for changes in various model assumptions. Some sensitivity analyses that are usually of interest are on the weights and scores. The weights representing the relative importance of the opportunities and threats are occasionally a point for discussion.

4. The study and results

This study evaluates 23 potential applicant countries for membership. A total of 120 researchers (30 groups of four) based in France, Germany, Switzerland and the USA provided the necessary data and judgments for this study. Each group independently used a PESTEL analysis and identified a set of opportunities and threats criteria for each country. The average number of opportunity criteria considered by the 30 teams was

62.4 and the average number of threat criteria was 54.8. Each group of researchers also developed its own importance weights for each criterion using AHP with Expert Choice (2006) software. Face-to-face communication was used to elicit judgments from the DMs. Table I presents selected opportunities and threat criteria used by various teams in this study.

We used the model presented in the previous section to calculate an average opportunity score and an average threat score for each group and each of the 23 potential applicant states under consideration. The overall opportunity and threat scores for each applicant country are shown as a radar diagram in Figure 2.

For opportunity scores for each country the farther the distance from the center of the diagram is more preferable for NATO and conversely, the closer the distance to the center of the diagram is preferred for the threat scores. Sweden, Austria, Switzerland and Finland with opportunity scores near the edge of the diagram provide NATO with tremendous opportunities while Sweden, FYR Macedonia, Belarus and Austria with threat scores near the center of the diagram endow NATO with very little threat. Sweden and Austria with high opportunity and low threat should be seriously considered for membership by NATO. On the contrary, Tajikistan, Moldova, Kyrgyzstan and Montenegro with opportunity scores near the center of the diagram provide NATO with very little opportunities while Russia, Tajikistan, Turkmenistan and Kyrgyzstan with threat scores close to the edge of the diagram provide NATO with tremendous threats. Tajikistan and Kyrgyzstan, for instance, with high threats and low opportunities should be seriously avoided as a member country by NATO.

As shown in Figure 3, the overall average opportunity score ($\tilde{\tilde{X}} = 0.483$) and the overall average threat score ($\tilde{\tilde{Y}} = 0.453$) divide the graph into four quadrants:

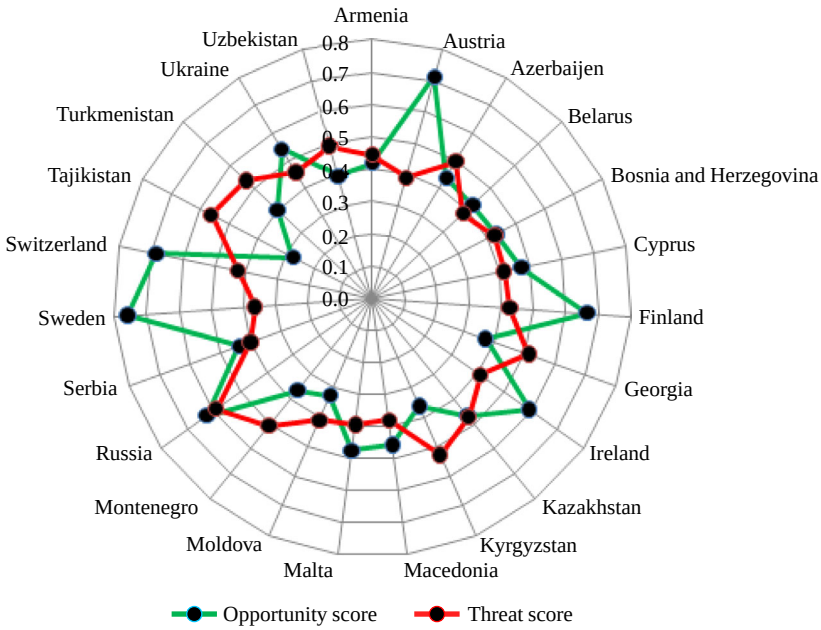

Figure 2.
The overall opportunity and threat radar diagram

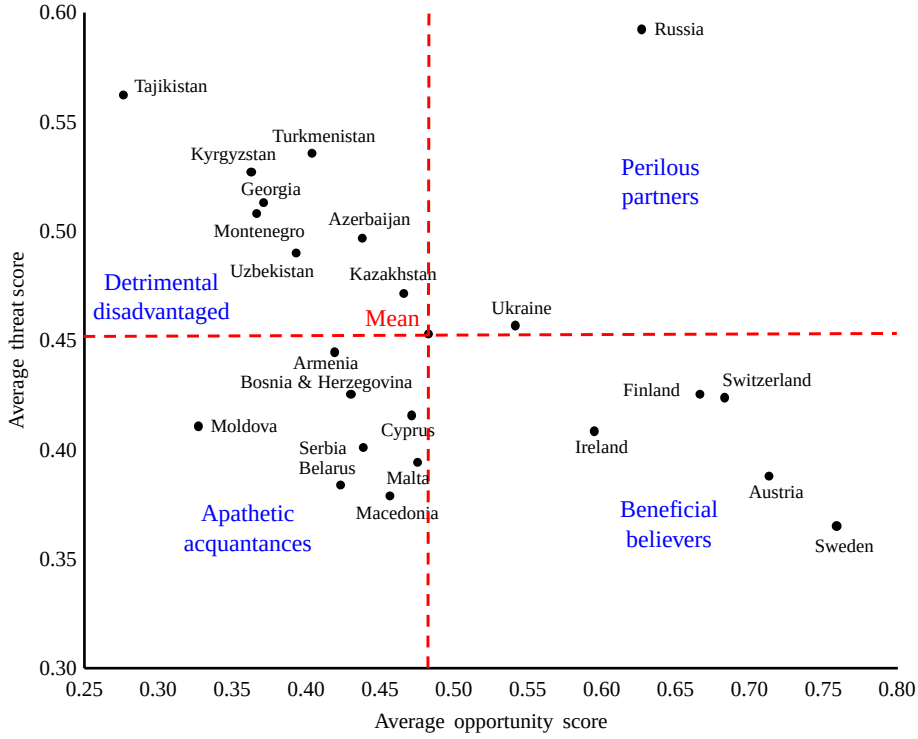

Figure 3.
The classification model results

(1) *Beneficial believers.* Sweden, Austria, Switzerland, Finland and Ireland should be pursued.

(2) *Detrimental disadvantaged.* Kazakhstan, Azerbaijan, Uzbekistan, Turkmenistan, Georgia, Montenegro, Kyrgyzstan and Tajikistan should be avoided.

(3) *Perilous partners.* Russia and Ukraine are risky and require an in-depth analysis of the tradeoff between the opportunities and threats.

(4) *Apathetic acquaintances.* Malta, FYR Macedonia, Cyprus, Serbia, Belarus, Bosnia and Herzegovina, Armenia and Moldova have nothing to offer to NATO.

The opportunity and threat scores along with their respective data bars for the potential applicant state are shown in Figure 4.

Finally, we find the Euclidean distance between each potential applicant state and the ideal state to develop a rank ordering of the 23 applicant states. States with smaller Euclidean distance from the ideal state are preferred to those with large Euclidean distance. Figure 5 shows the overall opportunity scores and threat scores (with data bars) of the 23 potential applicant states along with their overall rankings. Sweden, Austria, Switzerland, Finland and Ireland have the lowest Euclidean distances from the ideal state and should be pursued by NATO for membership.

Country	French Teams		German Teams		Swiss Teams		American Teams		All Teams	
	Opportunity Score	Threat Score	Opportunity Score	Threat Score	Opportunity Score	Threat Score	Opportunity Score	Threat Score	Opportunity Score	Threat Score
Armenia	0.435	0.418	0.366	0.387	0.467	0.458	0.408	0.516	0.419	0.445
Austria	0.691	0.481	0.544	0.291	0.870	0.336	0.747	0.444	0.713	0.388
Azerbaijan	0.484	0.527	0.383	0.416	0.412	0.555	0.472	0.490	0.438	0.497
Belarus	0.480	0.333	0.305	0.356	0.452	0.395	0.455	0.452	0.423	0.384
Bosnia and Herzegovina	0.413	0.307	0.391	0.425	0.412	0.486	0.504	0.485	0.430	0.426
Cyprus	0.490	0.326	0.403	0.340	0.498	0.491	0.494	0.507	0.471	0.416
Finland	0.721	0.544	0.564	0.325	0.698	0.352	0.682	0.481	0.666	0.425
Georgia	0.370	0.442	0.340	0.483	0.349	0.577	0.426	0.551	0.371	0.513
Ireland	0.597	0.488	0.487	0.312	0.639	0.434	0.656	0.401	0.595	0.409
Kazakhstan	0.521	0.506	0.398	0.402	0.470	0.511	0.476	0.468	0.466	0.472
Kyrgyzstan	0.313	0.490	0.335	0.577	0.408	0.611	0.395	0.431	0.363	0.527
Macedonia	0.384	0.287	0.433	0.350	0.459	0.431	0.551	0.448	0.457	0.379
Malta	0.468	0.412	0.427	0.321	0.529	0.357	0.477	0.487	0.475	0.394
Moldova	0.380	0.391	0.247	0.407	0.328	0.388	0.353	0.456	0.327	0.411
Montenegro	0.358	0.483	0.320	0.446	0.361	0.472	0.427	0.632	0.367	0.508
Russia	0.578	0.526	0.646	0.570	0.600	0.656	0.685	0.618	0.627	0.592
Serbia	0.421	0.307	0.402	0.402	0.506	0.386	0.425	0.509	0.438	0.401
Sweden	0.895	0.426	0.621	0.295	0.814	0.319	0.705	0.420	0.759	0.365
Switzerland	0.758	0.477	0.531	0.253	0.782	0.493	0.661	0.474	0.683	0.424
Tajikistan	0.252	0.610	0.270	0.639	0.275	0.533	0.307	0.468	0.276	0.562
Turkmenistan	0.363	0.377	0.373	0.557	0.420	0.690	0.458	0.519	0.404	0.536
Ukraine	0.572	0.371	0.499	0.552	0.569	0.448	0.525	0.457	0.541	0.457
Uzbekistan	0.422	0.583	0.370	0.413	0.412	0.499	0.368	0.466	0.393	0.490

Figure 4.
Research groups opportunity and threat scores

Rank	Country	Opportunity score	Threat score	Euclidean distance
1	Sweden	0.759	0.365	0.438
2	Austria	0.713	0.388	0.483
3	Switzerland	0.683	0.424	0.529
4	Finland	0.666	0.425	0.541
5	Ireland	0.595	0.409	0.575
6	Ukraine	0.541	0.457	0.647
7	Malta	0.475	0.394	0.656
8	Macedonia	0.457	0.379	0.662
9	Cyprus	0.471	0.416	0.673
10	Serbia	0.438	0.401	0.690
11	Belarus	0.423	0.384	0.693
12	Russia	0.627	0.592	0.700
13	Bosnia and Herzegovina	0.430	0.426	0.711
14	Kazakhstan	0.466	0.472	0.712
15	Armenia	0.419	0.445	0.732
16	Azerbaijan	0.438	0.497	0.750
17	Uzbekistan	0.393	0.490	0.780
18	Moldova	0.327	0.411	0.788
19	Turkmenistan	0.404	0.536	0.802
20	Georgia	0.371	0.513	0.812
21	Montenegro	0.367	0.508	0.812
22	Kyrgyzstan	0.363	0.527	0.827
23	Tajikistan	0.276	0.562	0.917
--	Mean	0.483	0.453	0.693

Figure 5.
Overall scores and rankings

5. Conclusions and future research directions

The addition of new members into NATO is a strategic issue that has profound economic and political effects on both the entering and existing members of NATO. The NATO enlargement problem is a complex MCDA problem that embraces qualitative and quantitative opportunities and threats. Potential applicant states must conform to a large number of quantitative and qualitative entry criteria established by NATO. The current selection process is ambiguous and lacks consistency. This study was conducted in response to the need for a meaningful and robust aggregation of subjective and objective judgments concerning a large number of competing and conflicting criteria. Indeed, the templates and models applied in this study could be applied to many other supranational organizations and multinational firms, especially for strategic alliances and country and market risk assessment.

We use AHP, subjective and objective data, and the theory of displaced ideal to reduce these complexities by decomposing the evaluation process into manageable steps. This decomposition is achieved without overly simplifying the process. The proposed method promotes consistent and systematic evaluation and selection of the potential applicant countries. Evaluations with specific weights and performance scores are used uniformly in the study and applied to all countries uniformly in the proposed evaluation of applicant process. Our method provides a consistent combination of all the criteria among all the selected countries. Whether the criteria represent real-world circumstances depend on the competence and degree of effort the DMs exerts in evaluating applicant countries and the political context that overrides the relevant criteria. The proposed MCDA model is useful in examining how sensitive

the overall Euclidean scores are to changes in the portfolio of selected states. Our approach also addresses questions about the sensitivity of the portfolio of selected countries to changes in the relative importance of the opportunities and threats, and the performance scores.

Among the potential applicant countries considered as "beneficial believers" are Sweden, Austria, Switzerland, Finland and Ireland while other countries, such as, Kazakhstan, Azerbaijan, Uzbekistan, Turkmenistan, Georgia, Montenegro, Kyrgyzstan and Tajikistan are considered as "detrimental disadvantaged". Furthermore, Russia and Ukraine were identified as "perilous partners" and Malta, FYR Macedonia, Cyprus, Serbia, Belarus, Bosnia and Herzegovina, Armenia and Moldova were identified as "apathetic acquaintances".

Our model is intended to assist DMs in the human judgment in NATO enlargement decisions. In fact, human judgment is the core input in the process. Our approach helps the DMs to think systematically about complex MCDA problems and improves the quality of the decisions. We decompose the NATO enlargement process into manageable steps and integrate the results to arrive at a solution consistent with managerial goals and objectives. This decomposition encourages DMs to carefully consider the elements of uncertainty. The proposed structured framework does not imply a deterministic approach in MCDA. While our approach enables DMs to assimilate the information and organize their beliefs in a formal systematic approach, it should be used in conjunction with management experience and their gained knowledge that is often unable to be represented by and encapsulated with country data. Managerial judgment is an integral component of NATO enlargement decisions; therefore, the effectiveness of the model relies heavily on the DM's cognitive capabilities.

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