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MULTI-CRITERIA ANALYSIS IN REGULATORY IMPACT ASSESSMENT IN GEORGIA

EXECUTIVE SUMMARY

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Executive Summary

Multi-criteria analysis (MCA) and Cost-Benefit analysis (CBA) are among the most widely used methods for comparing policy alternatives in regulatory impact assessments in many countries, including EU Member States. MCA is a much more comprehensive method than CBA, which focuses primarily on assessing the effectiveness of alternatives. CBA is based on market principles, monetising stakeholder behaviour and assigning monetary values to both benefits and costs. In contrast, MCA allows policy alternatives to be assessed against a range of criteria that can be measured in different units, including monetary units.

According to Government of Georgia Decree No. 35 "On Approval of Regulatory Impact Assessment (RIA) Methodology" dated 17 January 2020, MCA is defined as a mandatory analytical method for comparing different policy alternatives. In a standard RIA report, the use of MCA methods is required. For in-depth RIAs, it is mandatory to use not only MCA but also Cost Benefit Analysis and Cost Effectiveness Analysis.

The current approach to MCA in Georgia, based on the existing RIA Methodology, has several significant drawbacks. In particular, the Georgian RIA methodology scores alternatives on a scale from -5 to 5. This scoring is often subjective, and the scores assigned to different alternatives are usually not comparable. In addition, the current RIA methodology lacks a consistent approach to assigning weights to different criteria. Finally, the final assessment of policy alternatives simply ranks them without providing any additional information on their effectiveness.

The objective of this research paper is to examine different MCA methodologies discussed in the academic literature and used in international practice, including in the EU and the UK. In the EU, for example, Social Multi-Criteria Evaluation (SMCE) is commonly used for public policy analysis, particularly in ex-ante impact assessments. SMCE is specifically designed for public policy evaluation and emphasises the need to consider both technical and social aspects of the policy alternatives. This comprehensive approach is essential for an accurate assessment of policy alternatives.

Similar to the EU, the UK makes extensive use of MCA in the public policy evaluation process, as outlined in the Green Paper adopted by the UK government in 2022. This document clearly defines the MCA practices used in the UK. According to the Green Paper, a range of MCA methods should be used to ensure objective assessment and decision-making, including the assessment of complex, non-monetized criteria. In addition, the book emphasises that the choice of analytical methods may vary depending on the specific subject of the policy assessment.

According to the existing literature on the topic, Multi Criteria Analysis can be carried out using different methods and techniques. The choice of analysis method depends on factors such as the structure and complexity of the problem, the policy objectives and the evaluation criteria. Two main groups of MCA approaches can be identified in the literature:

- **Simplified MCA methods**: These methods typically involve simple assessment techniques that may be less accurate or based on subjective judgements.
- **Mathematical models of MCA**: Unlike simplified methods, mathematical models are based on well-defined mathematical objectives, constraints and functional relations. These methods often use statistical modeling, optimization and mathematical programming for finding an optimal decision.

Under the scope of this research paper, the following **simplified MCA methods** were thoroughly examined:

- **Simple Additive Weighting (SAW) method** – which represents one of the simplest and widely applied MCA methods. The SAW method is usually used in solving such policy issues which includes multiple evaluation criteria and multiple decision-making processes. It involves assigning weights to various criteria, and then scoring each alternative based on these criteria. The overall score for each alternative is calculated by summing the weighted scores. The alternative with the highest total score is considered the best choice. Although this method is simple and easy to use, it is characterised by a high degree of subjectivity and inconsistency.
- **Weighted Product Method (WP) method** – similar to the SAW method, the WP method also assigns weights to the criteria. The method implies multiplying the criteria scores for each alternative, each raised to the power of its assigned weight. WP method compares alternatives by taking the product of these weighted scores.
- **Lexicographic Ordering (LO)** – the LO method implies ranking alternatives based on the most important criterion first. If two or more alternatives are tied, the next most important criterion is used to break the tie, and this process continues until all criteria are considered or the tie is resolved. Notably using this MCA method is not advisable in the current Georgian RIA methodology context.
- **Analytical Hierarchy Process** (AHP) – AHP is a compensatory method of MCA and it involves structuring a policy problem into a hierarchy of policy problem components. Under this method, decision-makers make pair-wise comparisons to assign weights to each criterion, which are then used to score alternatives. This approach also ensures consistency in assigning weights to criteria. The alternative with the highest overall score is considered the best choice.
- **The Simple Multi-Attribute Rating Technique (SMART)** – SMART method is similar to the AHP, as it also considers the hierarchical structure of the problem components. However, one of the main differences between SMART and AHP methods is that under the SMART method alternatives are evaluated by scoring them against each criterion,

and these scores are then multiplied by the weights to calculate a final score for each alternative.

Furthermore, the research team has also examined the three most suitable **mathematical MCA methods** in the RIA context:

- **Technique of Order Preference Similarity to the Ideal Solution (TOPSIS) –** The TOPSIS method identifies the best policy alternative by comparing the geometric distance of each alternative to an ideal solution (the best possible scenario) and the worst policy option (the worst possible scenario). The alternative closest to the ideal solution and farthest from the worst solution is considered the best policy alternative.
- **Goal Programming (GP)** – The GP method is used to find the best solution that satisfies multiple policy objectives. Unlike other traditional optimisation methods that focus on a single objective, GP deals with multiple policy objectives by minimising the deviations from these desired objectives.
- **Data Envelopment Analysis (DEA) –** The DEA method allows to measure the effectiveness of the alternative - Decision-Making Unit (DMU) – considering their respective inputs and outputs.

As a result of the in-depth review of existing simple and mathematical MCA tools, analysis of the current RIA landscape in Georgia, and extensive consultations with sector stakeholders, the research team recommends the adoption of MCA methods in the Georgian RIA context:

1. **Simple MCA method – AHP:** The use of the AHP method improves the structuring of multi-criteria analysis by organising the decision-making process into a hierarchical model with three levels: objective, criteria and policy alternatives. This method also ensures greater consistency among decision-makers for a number of reasons: each criterion is evaluated separately against each other, reducing the likelihood of bias; AHP uses the Consistency Index (CI) to assess how consistently the criteria have been scored. If the CI is greater than 0.1, decision-makers can review and adjust the assigned scores to improve consistency; and finally, AHP normalises scores, ensuring that all criteria are compared on a similar scale, thus eliminating discrepancies between them.
2. **Mathematical modelling MCA method – TOPSIS:** The TOPSIS method is the most adaptable mathematical MCA methods in the context of RIA, characterised by less complexity and clarity of decision-making compared to other mathematical methods. In TOPSIS, the conclusion is not drawn based on the distance from the potential ideal result. This allows the decision-makers to better evaluate the effectiveness of the selected alternative. Another advantage of the TOPSIS method is that similar to the AHP method, the normalisation of the results allows the scores to be summed.

Notably, using the TOPSIS method in combination with the AHP method allows the decision-makers to better assess how close each alternative is to the ideal result and to reduce subjectivity in the decision-making process.

The research report also provides detailed step-by-step guidance on the use of both methods for RIA implementing authorities.

Based on the analysis of current practices in Georgia and the study of MCA methodologies, recommendations have been developed to improve the multi-criteria analysis phase of the regulatory impact assessment process:

- Considering the current RIA context in Georgia, it is recommended to use **AHP** (as a simple MCA method) and **TOPSIS** (as a mathematical method) methodologies in the decision-making process.
- Under the **standard RIA** it is recommended to use the **AHP method.**
- Under **in-depth RIA** using **TOPSIS methodology** is recommended.
- To **maintain the flexibility of the RIA methodology**, it is recommended not to make the recommended MCA methods part of the #35 Resolution of the Government of Georgia.
- For **highly complex reforms**, other advanced mathematical methods such as Goal Programming (GP) and Data Envelopment Analysis (DEA) can also be used in the evaluation process.
- It's crucial that **public officials involved in preparing or evaluating RIAs** have a solid understanding of objective multi-criteria analysis methods. It's therefore recommended that these methodologies be included in training programmes for public officials.