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INVESTMENT IN DEFENCE – A SECURITY REQIREMENT

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Abstract:
The most used idea in security analyses, especially within its military dimensions, is that of direct link between amount of defense spending, military capabilities and the necessity of a cooperative effort. Nevertheless, the new evolution of security environment requires a new approach for decision makers in order to make military expenditure for security reason. Therefore, an analytic instrument based on a multi-criteria approach could simplify and facilitate a realistic and faster decision in this field

Key words: security, investment, military expenditure, cooperation, sharing security, environment
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1. Introduction

The world is facing a long period of austerity because of a global crisis which seems to be far from a predictive end. International organizations, with responsibilities in the field of security feel the same threats on their budget for defence spending.

In this context, being a member of the North-Atlantic Treaty Organization and of the European Union too, implies both opportunities and obligations for the governments of the states as it has to modernize military structures according to the alliance's transformation process and European Defense Agency requirements and to adapt its military capabilities according to the new security environment.

For a better understanding of the impact that defense expenditure has on security, a theoretical approach to the issue is necessary.

2. Aspects regarding the current security environment

In today's world, there is a rather complicated process of reconstruction and reconsolidation of entities, between network architecture and an excessively fragmented reality, impregnated and distressed with technological, economic and informational gaps, by many unresolved issues. The completion and consolidation of national and political entities, therefore states, the only ones that can be integrated in an Alliance or a Union, such as NATO and the European Union, is not over yet.

Under these conditions, the evolution of global security confirmed that successful actions and stability can only be the result of multidimensional cooperation of the international community, by highlighting dialogue within an institutional framework and

by activating the decisive role that international organizations play in defining the state of security of the world.

The deterioration of public finances that has resulted from the financial crisis and consequent business downturn has had an impact on defense budgets in countries worldwide, notably the advanced economies, but especially in Europe. Public finances in Europe were in a serious situation even before the financial crisis and economic downturn, due to rising social security costs. In these circumstances, the European governments have been searching for an appropriate policy mix that would allow them to maintain their defense expenditures at a certain level and realize the required military capabilities. To enable governments to make the most effective use of their limited budget resources, in addition to cutting the number of troops to restrain the growth of personnel costs, there have been moves within NATO and the EU to promote the use of international equipment standardization and joint development. EU countries have, in fact, been making attempts to collaborate in military equipment acquisition through the European Defence Agency. Through this kind of multilateral cooperation, the European countries are searching for a way to address the host of problems they face in creating the military forces needed to cope with the new security environment [1].

National security of states can thus be ensured through their integration into collective security systems, by connecting domestic security to the external one, as well as to regional and international security arrangements. As a trend, projecting stability and security at regional and zonal level will depend increasingly on the dynamics of the *cooperative security framework use as a higher level of collective security, materialized in regional security arrangements*.

Today the interconnected security structures and organizations formula has been consolidated, the UN, NATO, OSCE and the EU, adopting jointly this type of security; the UN decided to start the reform of its basic principles and its organizational structure due to the radical change of the system of international relations, just as NATO did, which shifted towards a new security concept. Neither OSCE remained unchanged and opted to develop new mechanisms to ensure national sub regional, regional and global security, based on conflict prevention, an increase in the role of diplomatic instruments and crisis management capabilities.

Therefore, security is growing, in recent years, more and more cooperative, for the international security and development policy is the sole responsibility of the UN, which relies on the actions of international and/or regional organizations. Given that the number of internal conflicts increases, the economic crisis deepens, the austerity policy acquires global meanings with an impact on security institutions, terrorist actions continue and threats to national security can destabilize an area or region or even world peace, international cooperation in the field of security is strongly required.

By means of the actions of international and regional security and collective defence organizations disputes can be resolved peacefully and the national security of states can be ensured, by appealing to negotiation, mediation, good offices, inquiries, conciliation, arbitration, means which are provided by international regulations and which ensure maintaining peace and security.

The necessity of a cooperative effort seems to be the only option. Why cooperative effort? Because its subject as well as object is the effort sharing, and the state of security must constitute the starting point of any study in the field, regardless of the level of analysis (national, regional or global). The capacity to adapt and to sustain military forces in a multinational long term operations is the essential element of NATO strategy and the

degree to which security is provided reflects in the security of the group to which the individual belongs to.

Not only the figures are important but the flexibility and determination could play an efficint rol in developing and modernizing defence system as a part of the critical infrastructure [2].

As far as the cooperative effort is considered, the NATO "smart defence" initiative and the European "pooling and sharing" program could be good and very effective example of sharing the effort and an avoiding of duplicates and sparing of resourcesFurthermore, the concept of *"Smart Defence"* stands for a *new approach to the process of generating the capabilities necessary* to the North-Atlantic Treaty and involves, first of all, rethinking the use of Member States defence industries in order to adapt their production to the current needs of NATO, to meet the various challenges of the current and future security environment.

At the same time, the future development of the European Union military capabilities is closely linked to the implementation of the *"Pooling and Sharing"* concept, by means of which member States can collectively acquire capabilities that could not be acquired individually.

3. The cooperation between the European Union and NATO - an alternative for a realistic approach

Pooling & Sharing as a EU concept, refers to Member States-led initiatives and projects to increase collaboration on military capabilities can cover the full spectrum of capability development from the identification and harmonization of military requirements to through-life management and support (including certification and standardization). The objective is to support cooperative efforts of EU Member States to develop capabilities. It relies on the following principles [3]:

- Political will and commitment;
- Cost-effectiveness;
- Flexibility;
- Usability;
- Availability/Security of supply;
- Complementarily with NATO Smart Defence.

The most important aim of founding this initiative was to maintain and intensify the operational capabilities of each member states based on a better effect, sustainability interoperability and cost efficiency as a result.

The data [4] shows that the impact of the global crises on defense expenditure, in the first two years just after the crisis apparition is quite important. In this two years following the economic crisis, the overall defence expenditure of the 26 member sates decreased by almost 4% from a value of € 201.4 billion in 2008 with a signifficant defence expenditure decreased to € 194.0 billion in 2009 The decrease between 2009 and 2010 was much smaller amounting only to € 0.5 billion (-0,2%). As a result, the September 2010 meeting of European defence ministers in Ghent provided an serious impulse to European defence cooperation under the rubric of Pooling & Sharing.

Pooling & Sharing need to be based on long time military and political commitment and at the level currently, the following programes are focused on 11 main initiave as following [5]:

- Helicopter Training Programme
- Maritime Surveillance Networking
- European Satellite Communication Procurement Cell (ESCPC):
- Medical Field Hospitals:
- Air to Air Refuelling:
- Future Military Satellite Communications
- Intelligence Surveillance Reconnaissance (ISR):
- Pilot Training
- European Transport Hubs:
- Smart Munitions:
- Naval Logistics and Training:

A comon developing of some key military capabilities and, in the same time, the posibility of each army to use it is the fundamental goal for the decision makers in the field of defense and security. First steps should be done on interoperability and deployability of each country military capabilities in order to focus on the same task in having more forces and capabilities available for European Union security iterests. There are some dificulties on finding political arrangements on use of shared capabilities and the necessity of a political will, or legal national instruments.

The world is changing not only groups or social community, but individuals implications two. More and more people are involved in activities which has a direct impact on regional or global security environment. NATO has been change its Strategic Concept, an official document that outlines NATO's enduring purpose and nature and the fundamental security tasks of the Alliance

On the one hand, the group of experts who draw recommendations for The new Strategic Concept also admitted that *The new Strategic Concept should recognize that the EU's Treaty of Lisbon is designed, among other purposes, to strengthen Europe's military capabilities and command structures. Allies should welcome this development and use the Strategic Concept to affirm NATO's desire for a truly comprehensive partnership with the EU, one that is cost-effective, that is based on the principle of reciprocity and that encompasses the entire range of the institutions' mutual activities*[6].

On the other hand, NATO secretary general stressed on this subject the fact that *Smart Defence is about building capabilities together. But we also need to be able to operate them together. That is why I have launched the Connected Forces Initiative. It puts a premium on training and education, exercises, and better use of technology*[7].

The development and deployment of defence capabilities is first and foremost a national responsibility. But as technology grows more expensive, and defence budgets are under pressure, there are key capabilities which many Allies can only obtain if they work together to develop and acquire them[8].

NATO has also multinational projects are on the *Smart Defence* initiative, which need to be a new way of cooperation among NATO nations. There are currently 24 Smart Defence multinational projects that will deliver improved operational effectiveness, economies of scale and connectivity between national forces.

Nations continue to discuss promising areas for multinational cooperation such as logistic cooperation, collaborative training opportunities, and protection of forces. The projects are [9]:

- NATO Universal Armaments Interface.
- Remotely controlled robots for clearing roadside bombs.
- Pooling Maritime Patrol Aircraft.

- Multinational Cooperation on Munitions (Munitions Life-Cycle Management).
- Multinational Aviation Training Centre.
- Pooling & Sharing Multinational Medical Treatment Facilities.
- Multinational Logistics Partnership for Fuel Handling.
- Multinational Logistics Partnership - Mine Resistant Ambush Vehicle (MRAP) maintenance.
- Deployable Contract Specialist Group.
- Multinational Logistics Partnership – Helicopter Maintenance.
- Immersive Training Environments.
- Centers of Excellence as Hubs of Education and Training.
- Computer Information Services (CIS) E-Learning Training Centres Network.
- Individual Training and Education Programmes.
- Multinational Joint Headquarters Ulm.
- Female Leaders in Security and Defence.
- Joint Logistics Support Group (JLSG HQ).
- Pooling of Deployable Air Activation Modules (DAAM).
- Theatre Opening Capability.
- Dismantling, Demilitarization and Disposal of Military Equipment.
- Multinational Military Flight Crew Training.
- Counter IED – Biometrics
- Establishment of a Multinational Geospatial Support Group (GSG).
- Multinational Cyber Defence Capability Development (MNCD2).

Focused on closing the gaps on the field of military capabilities is a serious concern for Alliance leaders. Reducing the amount of military spending for United States required to other nations to increase their contribution in order to fill the difference. The Smart Defense program cover this fact and the capabilities categories of Smart Defense Projects are shown in the bellow diagram.

4. Defence expenditure –a multi -criteria analysis for EU countries

Knowing that without considering a model of multi-criteria analysis and evaluation indicators, the issue of investment in military capabilities remains dependent on obsolete approaches, we considered that this conditioning becomes a relevant methodological criterion, especially since in order to substantiate the practical approach of the paper we developed a model of multi-criteria analysis of military capabilities, a simple and easy to use one.

According to priori data, imposed criteria or alternatives, the mathematical models of decision making can be used in many ways and they are: identification and selection of best alternatives; sorting alternatives - from the best to the weakest one; clustering - assigning each alternative to a predefined uniform group; and identification of the important features for every possible alternative[10].

The need for a pragmatic approach to military capabilities calls for, in our view, the implementation of a *multi-criteria analysis method* to help decision makers to identify the shortcomings and problems that are characteristic to certain components, by capitalizing an appropriate response to the characteristics of the security environment, depending on the possibilities and options that it may put forward.

The PROMETHEE method used performs an analysis of the data at criterion level, on the one hand, and at the same time conducts an analysis between criteria using both the

weights associated with criteria, and statistical measures, such as minimum value, average value, maximum value and standard deviation.

The mathematical model we propose aims to achieve a hierarchy depending on the level of performance achieved, analysis performed by using the *Visual Promethee* application, which provides various options to address military capabilities starting from determining their level, the place held in a hierarchy or identification of opportunities for improvement and optimization.

We appreciate that, the value of the criteria and agreement upon them remains a distinct concern of political decision-makers, but the most important will be, in our view, to follow the pragmatic and innovative ways to align national security interests to collective ones and to better streamline government expenditure to support them.

The application is based on European Defence Agency (EDA) which collects defence data on an annual basis. The Ministries of Defence of the Agency's 27 participating Member States (all EU Member States except Denmark) provide the data. EDA acts as the custodian of the data and by the end of each year publishes the figures of the previous year for all the data to be complete.

Moreover there are some Benchmarks agreed in November 2007 when the Ministerial Steering Board approved four collective benchmarks for investment:

- Equipment procurement (including R&D/R&T): 20% of total defence spending
- European collaborative equipment procurement: 35% of total equipment spending
- Defence Research & Technology: 2% of total defence spending
- European collaborative defence R&T: 20% of total defence R&T spending

For our study we will take into account some of the following data [11]:

- **Macroeconomic data:** GDP, general government expenditure and population are based on data from Eurostat.
- **Total defence expenditure** is defined as total Ministry of Defence (MoD) expenditure and defence related expenditure from other sources (other Ministries' special budgetary lines).
- **Personnel expenditure:** all personnel-related expenditure for military and civilian personnel, including from non-MoD sources.
- **Infrastructure/construction expenditure:** expenditure for all construction of fixed military installations necessary for the exercise of command and efficient functioning of military forces, including country's share in multinationally funded military construction/infrastructure.
- **Investment:** defence equipment procurement and R&D (including R&T) expenditure.
- **Defence equipment procurement expenditure:** expenditure for all major equipment categories, that are not included in O&M spending.
- **Defence Research and Development (R&D) expenditure**: any R&D programmes up to the point where expenditure for production of equipment starts to be incurred. R&D includes R&T.
- **Defence Research and Technology (R&T) expenditure**: expenditure for basic research, applied research and technology demonstration for defence purposes. It is a subset of R&D expenditure.
- **Operation and Maintenance (O&M) expenditure:** covers O&M (spare parts and supplies) of major equipment, other equipment and supplies, and costs related to maintaining utilities and infrastructure.

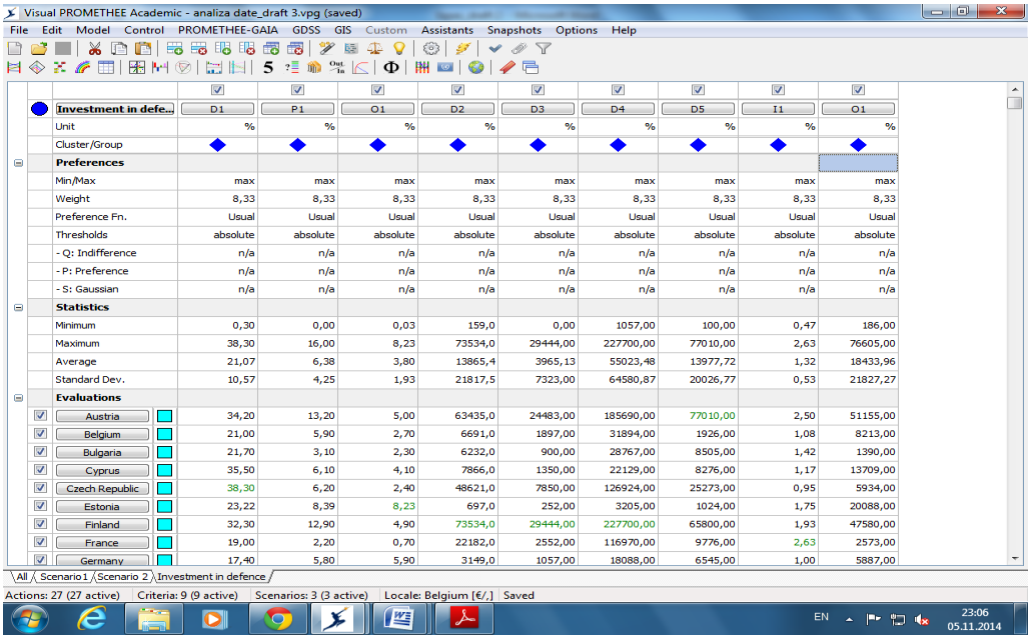
- **Operations costs:** all national expenditure to cover incremental (extra) costs linked to deployed operations outside the EU Member States' territory.

The list conteining performance indicators as criteria used in the following analysis could be a simple data base for a scenario which could show the level of a particular state in the field of defence expenditure.

By a scenario analysis consist of particular figure we can identify the level of defence expenditure of a particular country at a specific moment or in comparison with another country.

The content and phases of such a scenario are presented as follows.

After the current data setting in the *Visual Promethee* application, these could be viewed as the following Figure.



Investment in defe...	D1	P1	O1	D2	D3	D4	D5	I1	O1
Unit	%	%	%	%	%	%	%	%	%
Cluster/Group	◆	◆	◆	◆	◆	◆	◆	◆	◆
Preferences									
Min/Max	max	max	max	max	max	max	max	max	max
Weight	8,33	8,33	8,33	8,33	8,33	8,33	8,33	8,33	8,33
Preference Fn.	Usual	Usual	Usual	Usual	Usual	Usual	Usual	Usual	Usual
Thresholds	absolute	absolute	absolute	absolute	absolute	absolute	absolute	absolute	absolute
- Q: Indifference	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
- P: Preference	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
- S: Gaussian	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Statistics									
Minimum	0,30	0,00	0,03	159,0	0,00	1057,00	100,00	0,47	186,00
Maximum	38,30	16,00	8,23	73534,0	29444,00	227700,00	77010,00	2,63	76605,00
Average	21,07	6,38	3,80	13865,4	3965,13	55023,48	13977,72	1,32	18433,96
Standard Dev.	10,57	4,25	1,93	21817,5	7323,00	64580,87	20026,77	0,53	21827,27
Evaluations									
Austria	34,20	13,20	5,00	63435,0	24483,00	185690,00	77010,00	2,50	51155,00
Belgium	21,00	5,90	2,70	6691,0	1897,00	31894,00	1926,00	1,08	8213,00
Bulgaria	21,70	3,10	2,30	6232,0	900,00	28767,00	8505,00	1,42	1390,00
Cyprus	35,50	6,10	4,10	7866,0	1350,00	22129,00	8276,00	1,17	13709,00
Czech Republic	38,30	6,20	2,40	48621,0	7850,00	126924,00	25273,00	0,95	5934,00
Estonia	23,22	8,39	8,23	697,0	252,00	3205,00	1024,00	1,75	20088,00
Finland	32,30	12,90	4,90	73534,0	29444,00	227700,00	65800,00	1,93	47580,00
France	19,00	2,20	0,70	22182,0	2552,00	116970,00	9776,00	2,63	2573,00
Germany	17,40	5,80	5,90	3149,0	1057,00	18088,00	6545,00	1,00	5887,00

Fig.1 Defence expenditure for EU countries

The recorded value for each criteria for Romania according to the official data [12] are the following:

- D1- Defence Expenditure as % of GDP – 1,24
- P1 - Personnel Expenditure as % of Total Defence Expenditure - 84
- O1 - Operation and Maintenance Expenditure as % of Total Defence Expenditure - 10,50
- D2 - Defence Investment as % of Total Defence Expenditure - 4,30
- D3 - Defence Equipment Procurement Expenditure as % of Total Defence Expenditure – 4,10
- D4 - Defence R&D Expenditure as % of Total Defence Expenditure – 0,10
- D5 - Defence R&T Expenditure as % of Total Defence Expenditure – 0,10
- I1 - Infrastructure/Construction Expenditure as % of Total Defence Expenditure – 1,20
- O2 - Operations Costs (Deployed) as % of Total Defence Expenditure – 5,30

Taking into consideration all the selection criteria having the same weight and considering the maximum as an optimal level of preference we could have a hierarchy

based on Visual Promethee according Promethee Ranking or Flow Table as is shown in Figure 2

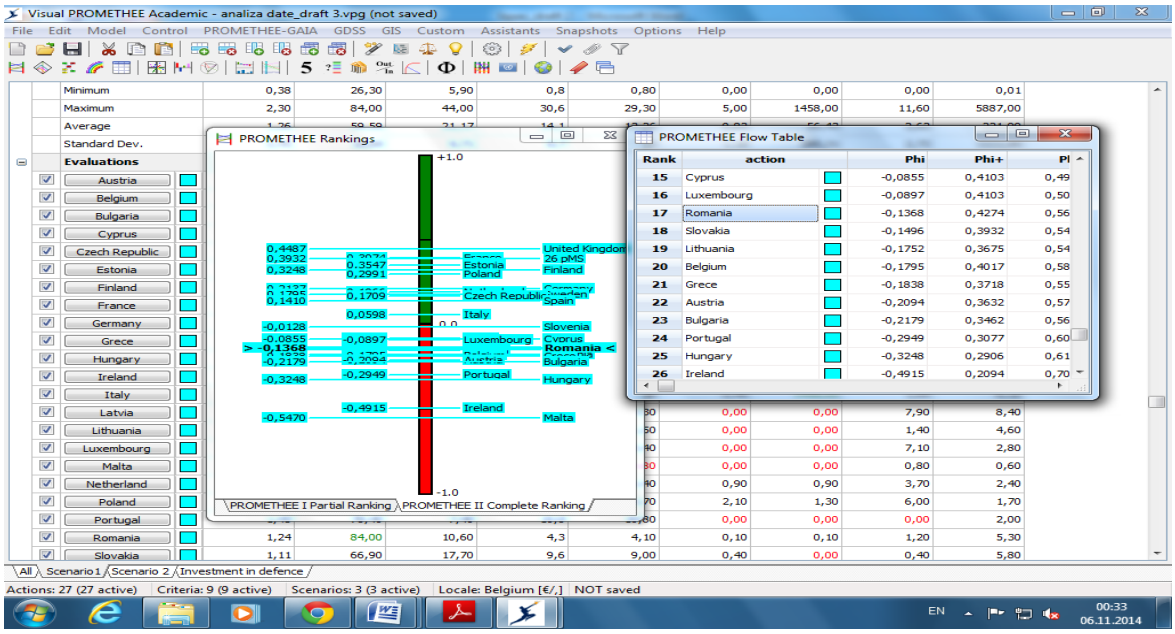


Fig. 2 The Country Hierarchy by Ranking or Flow Table

The study reveals that importance index for Malta is -5470, the lowest value, alternatively United Kingdom got 0,4487 the highest index.

In the same way Promethee method put Romania on the place 17 from the total of 26 EU countries with an index value -01368. The last country with a positive index is Italy (place 12) with a index value of 0,0598.

For every alternative selected using *Rainbow analysis* option we can see the criteria that satisfy the requirements or the other that need to be improved. (Figure 3).

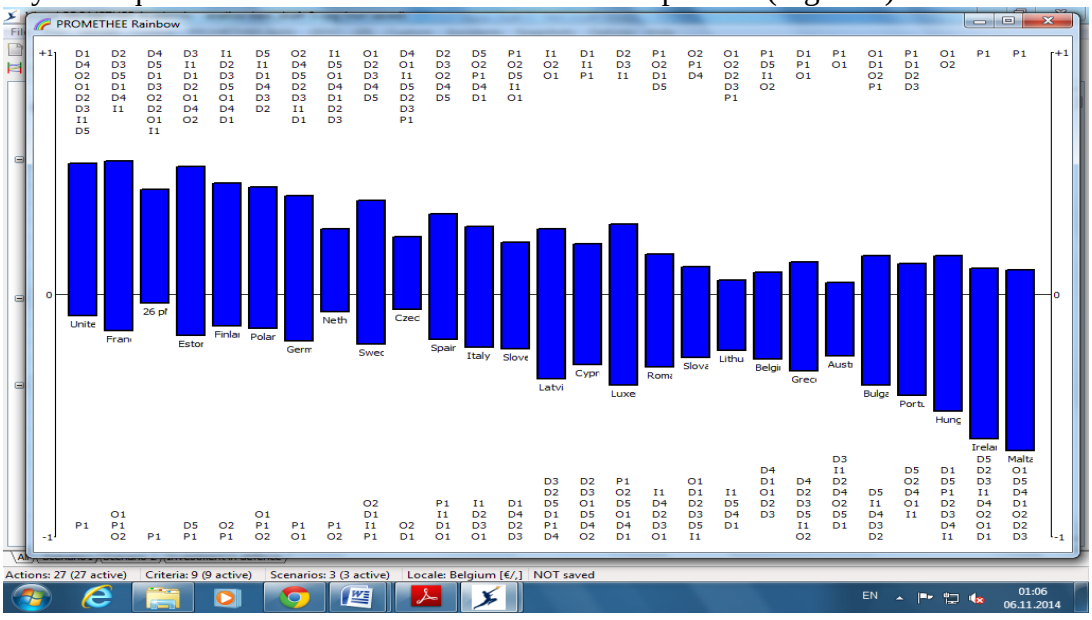


Fig. 3 Rainbow analysis

As far as Romania is considered, according to the figures, for achieving the average level of defence investment it must increase, mainly, the values for I1, D2, D3, D4 and O1 (Infrastructure/Construction Expenditure ,Defence Investment , Defence Equipment Procurement Expenditure , Defence R&D Expenditure and Operation and Maintenance Expenditure).For each country the particular situation can be seen using option „*Action profile*" (Figure 4) where we can see the domain investment under European average or the other for a average positive index D1, P1, D5, O2 (Defence Expenditure, Personnel Expenditure, Defence R&T Expenditure and Operations Costs).

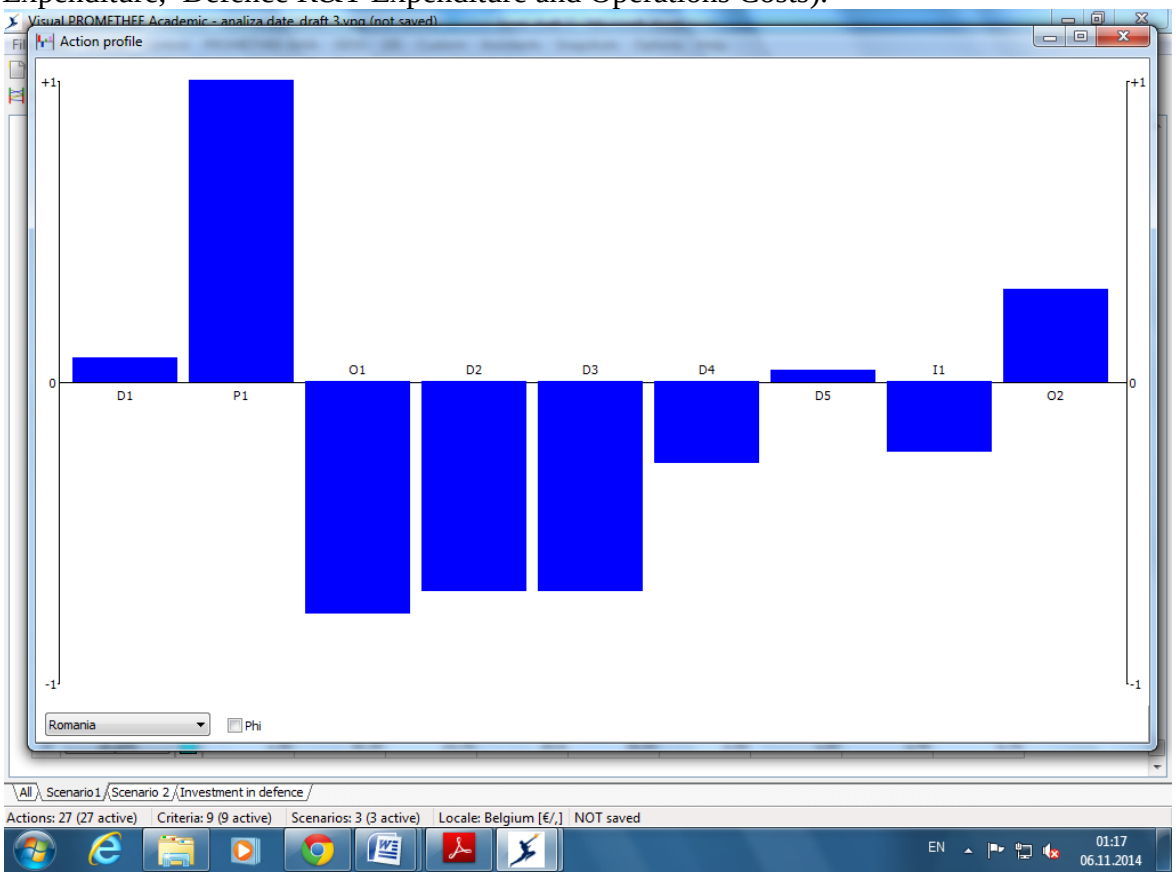


Fig. 4 *Action profile*

Additionally the application offers the possibility to make a decision based on data related to different scenario.

For example if we take into consideration for Romania the following scenario:

- Criteria D1- Defence Expenditure as % of GDP – will increase from 1,24% to 2% according to NATO requirement) it will be a percentage of approx. 61,29% increase in defence expenditure.
- This percentage could be used to optimize the investment level in other area such as: D3 - Defence Equipment Procurement Expenditure, D4 - Defence R&D Expenditure, D5 - Defence R&T Expenditure, I1 - Infrastructure/Construction Expenditure or O2 - Operations Costs (Deployed).
- The new values for tthose criteria will be as following:
  - D3 - Defence Equipment Procurement Expenditure as % of Total Defence Expenditure – *6,60 instead of 4,10*

- D4 - Defence R&D Expenditure as % of Total Defence Expenditure – *0,16 instead of 0,10*
- D5 - Defence R&T Expenditure as % of Total Defence Expenditure – *0,16 instead of 0,10*
- I1 - Infrastructure/Construction Expenditure as % of Total Defence Expenditure – *1,90 instead of 1,20*
- O2 - Operations Costs (Deployed) as % of Total Defence Expenditure – *8,50 instead of 5,30*

The new result will change the configuration in the European hierarchy and Romania will step up five position from 17 to 12 (Figure 5).

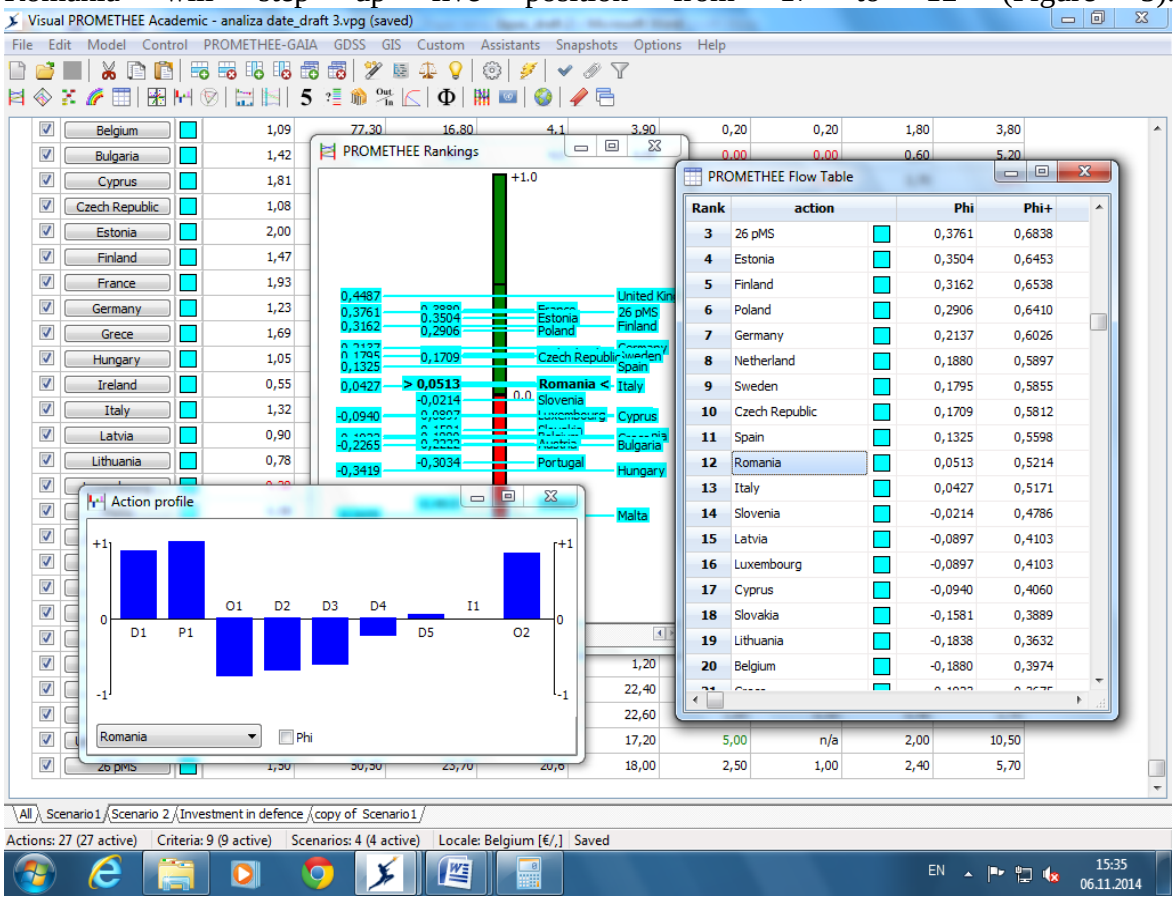


Fig. 5 The new hierarchy within the new scenario

4.Conclusion

It can be concluded that in this a multi-criteria analysis enable faster choice for the decision makers to take a decision in order to increase or decrease investment level in different fields of defence according to the current trend within European Union.

Apart from this, the political leaders could find line of cooperation between states which have the same limited budget in order to share or to avoid duplications.

Besides this, the *Visual Promethee* application, offer the possibility to choose different ratio for weight of any criteria based on the reality according to the capability requirement and the application could offer a faster option for the new approach

Moreover, the European Union stands for a necessity to maintain Euro-Atlantic credibility in the global context specific to the current situation. We consider the adaptation and strengthening of the partnership between the two organizations to the new realities based on the reconfiguration of a power balance and on the multiplication of risks and the challenges of the security environment to be an essential requirement for promoting common values and interests of the members of these two organizations.

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