ESTIMATING THE DEGREE PARTICIPATION IN COALITION

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SUMMARY

Conducting operations as part of a coalition is a major part of many countries planning so illustrative coalition operations are needed for studies. This paper indicates the importance estimating the contributions from allies and indicates how such estimates may be obtained. Examples comparing results with actual operations are shown.

INTRODUCTION

The UK, like many countries does not envisage any major warfighting operations using solely UK forces. We predicate our forces on many types of missions over a very wide area and we assume that we will be part of a coalition, possibly an ad-hoc one rather than as part of the well-defined alliance that would arise from an attack on NATO countries. There is no degree of certainty as to who will turn up and what they will contribute.

We could plan in a vacuum and pay no attention to the forces fielded by others but this is not a good basis. We do of course talk to potential partners but obviously none of us is willing to commit to playing a particular role in a particular circumstance. But we do need to make sensible decisions about our partners to give a backdrop against which we plan. This is as important as making realistic estimates of the threats we may face.

It would be very easy to assume that each potential partner put the maximum forces they have into every conflict. This is unrealistic. Putting in maximum forces involves subjugating all other tasks civil as well as military and does not happen outside of conflicts involving national survival. When we have assumed maximum forces in our models it has been very difficult to conduct studies for the results are insensitive to changes in equipment or force levels. If we take out an item there is always something else to do its job. Likewise it is very difficult to see the advantages of improvements for all the objectives are being achieved. We can only be sure that we have coherent and balanced forces when we seek minimum forces for each operation.

The totality of our forces are determined not by the needs of any one scenario but by a requirement to cover a wide range of scenarios some of them concurrent with others. Adopting this approach ensures we have forces with a wide utility that are not predicated on any one particular scenario or threat so we have some robustness in our planning. But to do this, we do need to estimate the minimum coalition forces

required to meet objectives and the proportion of the forces each partner may send. One of the ways we set about this is the subjected of the rest of the paper.

The assumption that minimum are used to achieve objectives is of course a modeling artifact and operational planning would take a very different route.

REASONS FOR TAKING PART IN OPERATIONS

There are many reasons why a particular country may join a coalition. Their own strategic interests may be directly involved or they may just be showing solidarity with allies in supporting a just cause. We have found that the following list of reasons captures the range reasonably well.

(a) National FILO: Freedom, Integrity, Law and Order: this criterion refers to any physical security threat to the country's home territory and its people.

(b) Trade: the country's trade and commercial interests especially access to markets.

(c) Overseas Territories: the Freedom, Integrity and Law and Order of the country's Overseas Territories.

(d) Close Allies: the interests and security of those nations to which a country is tied through NATO, the WEU, EU etc, and also the country's relations with them.

(e) Other Allies: the interests and security of less closely integrated allies and the country's relations with them.

(f) Resources: Access to the key enablers of modern life. This includes strategic raw materials, natural resources, fishing rights and access to the flow of information (commercial and intelligence).

(g) Nationals: the safety of the country's nationals (and other entitled persons for which a country has responsibility) abroad.

(h) Humanitarian: any substantial humanitarian/ethical considerations in the regions in question, as seen from the country's perspective.

(i) International Status: impact upon the country's international influence and prestige.

(j) Domestic Status: the impact of the operation upon country's domestic public and political opinion.

METHOD

Dstl Analysis working me had developed a method for prioritising scenarios when they occurred concurrent with each other. The method we developed used an earlier version of the list and a straightforward Saaty approach. I then built on this in house to give an estimate of the forces a country might send. In outline, the relative values each might place on each of the criteria and the relative ranking of the criteria were estimated. This allowed the weighted averages to be calculated. These were then assumed to be equivalent to the countries' interests in the scenario. The key

assumption was then made that the forces sent would be proportional to the interest so calculated. Thus in a scenario, a country with a large interest would send nearly all their forces while a country with a low interest would send relatively little of their forces.

We used the Saaty pair wise comparison method[1] to carryout the arithmetic. I will run through an example.

I will use US, UK, France, Germany and Italy as an example as they are the largest NATO countries and account for 90% of NATO's expenditure although the case shown is not real.

We adopted a seminar type approach with small teams of about 4 people plus a facilitator discussing the cases. Small teams were used to allow all to have a reasonable say in the discussions and to keep interest high.

The first necessity was to discuss the meanings of the terms within the context of the particular scenario. For instance term "strategic resources " can have a slightly different meaning in each case. In the case of a Gulf conflict it could mean the denial of oil to a large part of the world but in the case of a peace support operation in the Balkans it can mean the loss of routes through the area. The exact meaning of the terms is not too important in each case provided they are interpreted consistently throughout a scenario. Normally in a Saaty approach you would first of all determine the relative importance of each of the terms but we did found it better to start with each countries' views of the terms and then finally rank the actual terms. This was because discussing each country with respect to each term helped to define that term better so leaving the ranking to the end was easier.

Thus we would take two countries say UK and US and discuss whether or not the strategic importance of say the gulf was more important to one or the other. If they were the same the value 1 would be put in the appropriate cell. If not equal, how much more important one was compared to the other was assessed on a scale of 2 to 9. 2 being just slightly more important and 9 being extremely more important. If less important the scale was from 1/9 to1/2. The cells are filled in systemically so if the UK: US cell has 5 in it the US: UK cell would have 1/5 in it. Not all the comparisons need be subjective there are several for which we can use authorative data sources. The ones associated with trade, resources and expatriates can frequently be ranked on readily available data. So some prior investigations before the seminars to collect such data helped.

The ranking of the importance of the factors was carried out using a similar pair wise comparison. The rankings are not constant but vary with each scenario. Thus the importance of strategic importance of the area would normally be ranked much higher than humanitarian considerations in a Middle East conflict than in a disaster relief scenario.

One change we did make to the normal Saaty process was to re-weight the rankings 1 to 9 given by the participants. As a factor given a 9 was felt to be far more

[1] T Saaty "The Analytical Hierarchy Process" 1988 ISBN 0-07-054371-2

important than 9 times the value of another given 1. Internally in the mathematics we used a simple power law scale although the results were not too sensitive to this.

The mathematics of the Saaty process was otherwise straightforward. In its very simplest form it just gives a straightforward weighted average across the factors for each country. The resulting average value was taken as the relative interest each country has in the scenario.

Thus we might have:

US	UK	France	Germany	Italy	TOTAL
20	25	30	15	10	100

Table 1 Relative interest in particular scenario (hypothetical case)

The next step was to assess the pool of forces each nation might draw upon to send a force. This is usually a lot less than the total forces available to a country for they have to deploy the force and sustain it in the field. The pool may be under ¼ of the forces available to a country. Estimating this is an art in itself. But estimates can be made by comparing a country's forces with those for which good estimates are available. The pool is very aggregated and usually expressed in terms of major warships, brigades equivalents and fast jets with no finer breakdown. The pools are then multiplied by the "interest" the country has in the scenario to indicate the relative size of the force it might send. This was the key step: assuming the countries will send a proportion of their available force that is proportional to their interest in the scenario. The final step was to translate to the percent of the force provided by each country.

	US	UK	France	Germany	Italy	TOTAL
Interest	20	25	30	15	10	100
Force size	60	10	10	10	5	95
Product	12	2.5	3.0	1.5	0.5	19.5
% sent	61	13	15	8	3	100

Table 2 Calculation of percents sent

We do not include indigenous or home country forces in the analysis for these are usually assumed to include all those available. Neither do we include all countries for the list would be too large. We make a preliminary estimate of the main countries likely to be involved and then work with these. At the end of the process we make an adjustment for the others. Typically these are between 10 and 30% of historical conflicts so setting a contribution from these at 20% will not give too large an error.

RESULTS

So how reliable are the results? I will show a few examples. First of all the consistency of the results between groups. The Saaty process can itself give a measure of consistency but I am not sure that this means a lot to me let alone my MoD colleagues so I will just give a few details of the end results of different groups examining the same scenario.

Over a period of about 2 years 4 different groups in different circumstances had revisited at least one particular scenario. For one of the countries the four groups gave percentage contributions of: 14%, 15%, 14% and 18%. For one of the other relatively large countries the corresponding values were: 6%, 6%, 7%, 5% and for another 2%, 1%, 2%, 1% ie this last was unlikely to play a significant role. The average variance was 1%. Not all the cases were as consistent as this but the one shown is for one of the main scenarios.

The agreement is convincing but I must point out that the process hides inconsistency in the Saaty process because the forces a country has can dominate the results. The previous table is repeated with the interest of France halved. The French percent sent does half but the effect on the others is not too great about 6% of the former values.

	US	UK	France	Germany	Italy	TOTAL
Relative Interest	20	25	15	15	10	85
% sent	67	14	8	8	3	100
% sent From Table 1	61	13	15	8	3	100

Table 3 Result of changing interest of France from 30 to 15

So we have reproducibility. But how good is it at reflecting what has actually happened? There are problems here because the contributions by individual countries vary over time. This is not so bad for a conflict such as the Gulf War but it is not so easy to define contributions for Balkans where there have been large changes over the years. The following table shows the percentage contributions for the Gulf War and our estimates for a few of the countries who be involved in a future conflict in the Middle East although not an exact reply of the Gulf War as events have moved on. The agreement is sufficient for an analytical background. Although, on the day, the world events and other intangibles would make it unlikely that the results would be as predicted here or as indeed as last time.

Country	A	B	C	D	E
Saaty	60	15	5	<1	<1
Actual	80	11	5	<1	<1

Table 4 Middle East example

Another example is for the early stages of the Balkan conflict. Again the results show a reasonable agreement. We would like the process to be 100% accurate but we are more than satisfied if it can estimate the UK contribution to within about 30%. For this will tell us if we need to put in a division or a brigade.

Country	A	B	C	D	E
Saaty	48	11	10	6	5
Actual	26	16	13	5	4

Table 5 Balkans example

The agreements are not perfect but it does give a good indication of the order of the contributions.

CONCLUSIONS

An indication of the contributors to a scenario sufficient to provide the backdrop for studies can be obtained by systematically reviewing the reasons for taking part in an operation. These need to be listed, ranked and averaged for each country to give their relative interest in it. The forces a country could send need then be factored by this interest to give the relative size of forces they could send to the scenario. The Saaty process can be used to handle the arithmetic.

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