

Crisis and Military Conflict Management an Econometric Approach

Stelian STANCU

Department of Economic Cybernetics, e-mail: stelian_stancu@yahoo.com

Tudorel ANDREI

Department of Statistics and Econometrics, e-mail: andreitudorel@yahoo.com

Academy of Economic Studies, Bucharest, ROMANIA

The paper proposes to study the theoretical aspects concerning the management of crisis and military conflicts.

The indices selected for crisis management are further highlighted and classified into those related to the global, continental, and regional level (mainly focusing on the Black Sea area) as well as Indices related to the national level.

Furthermore, the paper introduces an econometric analysis of the crisis and military conflicts using such dependent variables as follows: military expenses, Gross Domestic Product, rate of interest, inflation rate, size of the population occupied, number of inhabitants, migration rate, birth rate, death rate and the number of terrorist attacks.

Mention should be made that the econometric analysis is based on the data valid for Romania against the regional and international background.

Keywords: *crisis management, military conflicts management, specific indices, econometric analysis, dependent variable, trend.*

1 Theoretical approaches to crisis and military conflict management

Risk management is a relatively new field of activity and concept as it was acknowledged and defined only in 1929 - 1930, when it was defined for the first time.

It is known that, in general, humankind understood the necessity of unifying the efforts and the concerns to extinguish conflicts, hence looking for more or less efficient methods and institutions.

Whether the causes are objective or subjective, crises cannot be left unsolved. A crisis can be appeased or settled by means of an aware subjective, willful, and controlled intervention.

This action can be realized by political, juridical, economical, and military bodies at a national or international level, or by special organizations or bodies created to solve certain crises.

Consequently, crisis management is a complex action, materialized, directed, and sustained on many levels – political, diplomatic, economic, military, etc – in order to decrease the tensions that can induce crisis in a coun-

try or group of countries, to restrict and control negative aspects.

First and foremost such action implies a thorough knowledge of the causes which can or generate contradictions or tensions and the factor favoring or disfavoring such contradictions.

Determining the causes of a critical situation should contain all specific forms, an impartial analysis and estimation - unbiased by prejudices or feelings - of the relevance of each type of contradiction - economic, political, juridical, ethnical, or religious, etc, to that particular situation.

Accordingly, the analysis cannot be complete if the interface of states or communities directly involved in the geographic area of the critical situation is not clearly distinguished. To reach a complete analysis one should also be aware of other parties acting in the area which belong to powers, states or groups of states, communities, organizations, international or national bodies, and any type of forces.

Crises usually develop in a sequence of stages such as:

a) disagreement;

b) a state of tension, which has several stages of its own, depending on the severity of contradictions, which arise in the social fields – such as politics, diplomacy, information, culture, military - without getting to the armed combat; and
 c) armed conflict or armed combat.
 In conclusion, managing a critical situation means aiming at settling such situations by using specific forms and methods for each stage.

2. Selected indices concerning crisis management

To realize this intercession, a series of Indices were selected, which fall into the following categories:

- indices of state and dynamics:
- indices referring to the global state;
- indices referring to the continental state;
- indices referring to the regional state (Black Sea area);
- indices referring to the state of the nation;

Table 1

Indices	Values*				
	Normal	Abnormal	Pre-crisis	Crisis	War
1. Indices concerning the economical state and dynamics					
Indices concerning labor force					
Level of employment					
Indices concerning the agriculture					
Worked farming land (% from the total farming land)					
2. Indices concerning Gross Domestic Product					
Total value					
3. Indices concerning the financial state and dynamics					
Structure of the national financial system					
Rate of interest					
Rate of inflation					
Situation of domestic currency					
Rate					
Banking system					
Value of the operations					
4. Indices concerning the demographic state and dynamics					
Structure of population					
Average population					
Birth rate					
Birth rate					
Attack rate					
Migration of the population					
Migration rate					
Demographic growth					
Rate of total growth					
5. Indices concerning the security state					
Indices concerning foreign security					
Financial threats					
Balance of payments (BOP)					
Indices concerning the domestic security					
Indices of the military security					
Value of military expenses (% from GDP)					
Rate of military budget increase					
Casualties (% of effective force)					
6. Social and military Indices					

Number of armed conflicts and wars per year					
Number of civil victims of conflicts per year					
7. Military Indices					
Effective force per thousand inhabitants					
Number of states holding nuclear power					
Number of new major military bases					
Number of paramilitary structures					
Number of nuclear tests					
8. Indices of state and dynamics concerning terrorism assessment					
Indices of system and state					
Number of terrorist organisations					
Number of terrorist attacks					
Dynamic Indices					
Frequency of terrorist actions per the time unit (month)					
Annual average of terrorist actions					

* As values of economic indices and of adjustments for the military ones are specific to each country or region they were not specified in the table above.

3. The econometric analysis of the crisis and military conflicts

Notations:

C_m - military expenses;

GDP - Gross Domestic Product;

R_r - rate of interest;

R_i - inflation rate;

P_o - employment;

N - number of inhabitants;

R_m - migration rate;

R_n - birth rate;

R_d - death rate;

A_t - the number of terrorist attacks;

• By performing the regression between *Value of military expenses* and *Number of terrorist attacks*

$$Military\ expenses = f(No\ terrorist\ attacks) + \epsilon$$

the results obtained are given in the next table, showing:

- a weak dependency between military expenses and terrorist attacks, based on the history of the relationship between the two elements, i.e. one terrorist attack in 17 years, which can be explained by the constant preparation to prevent such threats;

Table 2.

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.154534
R Square	0.023881
Adjusted R Square	-0.03713
Standard Error	0.623146
Observations	18

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	0.152001	0.152001	0.391442	0.540365
Residual	16	6.212976	0.388311		
Total	17	6.364978			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	1.401176	0.151135	9.271018	7.79E-08	1.080784	1.721569
X Variable 1	-0.40118	0.641212	-0.62565	0.540365	-1.76048	0.958132

In this case, the regression equation is given by:

$$C_m = 1.401176 - 0.40118A_t ; R^2 = 0.023881$$

(0.151135) (0.641212)

where the values in parentheses represent the standard error.

Thus the graphs suggest that the normal distribution is on the rise as compared to the simple percentile. An inconsistency between the rising trend

of military expenses and the number of terrorist attacks can also be noticed.

To exemplify, analyzing the same dependency with respect to Israel, where the number of terrorist attacks it regretfully is very high, the results are as follows:

Table 3.

SUMMARY OUTPUT

<i>Regression Statistics</i>						
Multiple R	0.007135					
R Square	5.09E-05					
Adjusted R Square	-0.16661					
Standard Error	0.658188					
Observations	8					

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	0.000132	0.000132	0.000305	0.986623
Residual	6	2.599268	0.433211		
Total	7	2.5994			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	10.10535	0.384724	26.26649	2.01E-07	9.163967	11.04674
X Variable 1	-0.00022	0.012832	-0.01748	0.986623	-0.03162	0.031175

The regression equation is:

$$C_m = 10.10535 - 0.00022A_t ; R^2 = 5.09E - 05$$

(0.384724) (0.012832)

where the values given in parentheses represent the standard error.

- By performing the regression between *Value of military expenses*, *GDP* and the *rate of Migration*

$$\text{Military_expenses} = f(\text{GDP}, \text{Migration_rate}) + \varepsilon$$

the results obtained, given in the next table, suggest that:

- these two endogenous variables, *GDP* and *Migration rate*, explain well enough the dependent variable *Military expenses*, as Multiple R=0.936362 and R Square= 0.876774.

Table 4.

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.936362
R Square	0.876774
Adjusted R Square	0.859171
Standard Error	0.232134
Observations	17

ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	2	5.367746	2.683873	49.80631	4.31E-07	
Residual	14	0.754407	0.053886			
Total	16	6.122153				

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-0.93623	0.562743	-1.66368	0.11839	-2.14319	0.270739
X Variable 1	0.004722	0.000535	8.822163	4.31E-07	0.003574	0.00587
X Variable 2	-0.12335	0.056841	-2.17002	0.047702	-0.24526	-0.00143

The regression equation is given by:

$$C_m = -0.93623 + 0.004722\text{PIB} - 0.12335R_m; R^2 = 0.876774$$

(0.562743) (0.000535) (0.056841)

where the values in parentheses represent the standard error.

- By performing the regression between *Value of military expenses* and *GDP, Rate of interest, Rate of inflation, Level of employment, Population number, Migration rate, Birth rate, Terrorist Attack rate, Number of terrorist attacks*:

$$\text{Military expenses} = f(\text{GDP, Rate of interest, Rate of inflation, Level of employment, Population number, Migration rate, Birth rate, Attack rate, Number of terrorist attacks})$$

the results obtained, given in the next table, show:

- a strong dependency between the military expenses and all the explanatory variables considered in the analysis;

Table 5.
SUMMARY OUTPUT

<i>Regression Statistics</i>						
Multiple R	0.985657					
R Square	0.97152					
Adjusted R Square	0.939481					
Standard Error	0.150529					
Observations	18					

ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	9	6.183705	0.687078	30.32241	3.05E-05	
Residual	8	0.181273	0.022659			
Total	17	6.364978				

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	9.210107	4.640896	1.984554	0.082465	-1.49182	19.91204
X Variable 1	0.003244	0.000705	4.600845	0.001754	0.001618	0.00487
X Variable 2	0.00612	0.003671	1.667008	0.134072	-0.00235	0.014586
X Variable 3	0.001096	0.000816	1.343352	0.216017	-0.00079	0.002978
X Variable 4	1.05E-06	3.02E-06	0.345841	0.738381	-5.9E-06	8.02E-06

X Variable 5	-1.5E-07	2.11E-07	-0.71491	0.494994	-6.4E-07	3.36E-07
X Variable 6	-0.04708	0.035401	-1.32984	0.220235	-0.12871	0.034557
X Variable 7	-0.31494	0.135826	-2.31869	0.049019	-0.62816	-0.00172
X Variable 8	-0.31385	0.115076	-2.72736	0.025952	-0.57922	-0.04849
X Variable 9	0.186564	0.190879	0.977394	0.357001	-0.2536	0.626732

The regression equation:

$$C_m = 9.210107 + 0.003244\text{PIB} + 0.00612R_r + 0.001096R_i + 0.000000105P_o - \\ (4.640896) \quad (0.000705) \quad (0.003671) \quad (0.000816) \quad (3.02E-06) \\ - 0.000000015N - 0.04708R_m - 0.31494R_n - 0.31385R_d + 0.186564A_t \quad (2.11E-07) \\ (0.035401) \quad (0.135826) \quad (0.115076) \quad (0.190879)$$

$$R^2 = 0.97152$$

where the values in parentheses represent the standard error.

4. Conclusions

According to the above presentation, irrespective of the nature of the causes, be it objective or subjective, critical situations cannot be ignored and one cannot hope that such situations will eventually be settled without any intervention.

Moreover, a crisis can be appeased or settled only by means of an aware subjective, wilful, and controlled intervention.

To reach such resolution, the action has to be undertaken via various bodies - political, juridical, economic, and military - that currently operate in each country or at an international level, or via organizations or entities specifically created to solve certain crises.

The following can be deduced from the econometric analysis:

- there is a weak dependency between military expenses and terrorist attacks, based on the history of the relationship between the two elements, i.e. one terrorist attack in 17 years, which can be explained by the constant preparation to prevent such threats;
- the two variables are inconsistent with each other;
- the rising trend of military expenses is inconsistent with the number of terrorist attacks.
- therewith, there is a noticeably strong dependency between the military expenses and all the explanatory variables considered in the analysis.

Therefore, the paper qualifies for a reference guide to highlighting dependency with concern to crises and military conflicts.

Bibliography

- Andrei T., Stancu S.**, *Statistica-teorie și aplicații, First edition*, Editura Economica, Bucharest, 1995;
- Andrei T., Stancu S., Pele D.**, *Statistica-teorie și aplicații, Second edition completed and reviewed*, Editura Economica, Bucharest, 2002;
- Barry B., Weaver O., Jaap W.**, *Security. A New Framework for Analysis*, Lynne Reiner Publishers Inc., London, 1998;
- Bălan N., Iacob D.**, *Teoria organizațiilor*, Buletinul Învățământului Militar, Third Year, Issue N° 1-2, Bucharest, 1996.
- Brzezinski Z.**, *Comment l'Amerique doit vivre avec la nouvelle Europe*, in *Commentaire*, vol. 23, N° 91, 2000;
- Bonciu C.**, *Instrumente manageriale psihosociologice*, ALL BECK, Bucharest, 2000.
- Buzănescu Șt.**, *Introducere în sociologia organizațională și a conducerii*, EDP R.A., Bucharest, 1995.
- Johns G.**, *Comportament organizațional*, Editura Economică, Bucharest, 1996.
- Mătieș M.**, *Noile politici de securitate ale statelor occidentale în secolul XXI*, in *Securitate națională, politică de apărare și istorie*;
- Stancu S.**, *Microeconomie. Comportamentul Agenților Economic-teorie și aplicații*, Editura Economica, Bucharest, 2006;

- Stancu S., Mihail N.,** *Metode și tehnici de conducere*, Editura Economica, Bucharest, 2006;
- Stancu S., Chiriță N.,** *Decizii economice în condiții de incertitudine-cu aplicații pe piața financiară*, Editura Economică, Bucharest, 2004;
- Stancu S.,** *Modelarea cibernetică a fenomenelor economice*, ASE, Bucharest, 2003;
- Stancu S.,** *Teoria contractelor-negocierea și derularea contractelor economice*, ASE, Bucharest, 2002;
- Stancu S.,** *Competiția pe piață și echilibrul economic*, Editura Economica, Bucharest, 2002;
- Stoica M.,** *Managementul organizațiilor militare*, Buletinul Învățământului Militar, anul III, N° 3-4, Bucharest, 1996;
- Zorlețan T., Burduș E., Căprărescu Gh.,** *Managementul organizației*, Editura Economică, Bucharest, 1998;
- Wallace H., Wallace W.,** *Policy Making in the European Union*, Fourth edition, 2000, Oxford University Press, UK
- Wohlfeld M.,** *The Effects of Enlargement on Bilateral Relations in Central and Eastern Europe*, UEO Institute for Security Studies, 1997;
- *** *The Economist*, 2000-2006 collection;
- *** *The Daily Telegraph*, 2000-2006 digital collection;
- *** *Adevărul, Azi, Cotidianul, Cronica Română, Curentul, Jurnalul național, România liberă* and *Ziua*, 2000-2006 collection of daily newspapers;
- *** Ministerul Apărării Naționale, *Strategia Militară a României. Securitate militară prin: capacitate defensivă credibilă, restructurare și modernizare, parteneriat operațional intensificat, integrare graduală*, 2000, Editura Militară, Bucharest;
- *** *Foreign & Commonwealth Office (FCO), Joint Declaration Issued at the British-French Summit, Saint-Malo, France, 3-4 December 1998*, www.fco.gov.uk/news/newstext.asp?1795, posted on 17 February 2000;
- *** *Observatorul Militar*, Year XVI, N° 3(731) of 21-27 January 2004;
- *** *The Economist, Enlarging the European Union. A New Pace?*, issue: 2 October 1999, pp. 32-33;
- *** *The Economist, A Survey of Europe. A Work in Progress*, a supplement issued on 23 October 1999.