Chapter 12
International relations

In modeling international relations, the subjects under consideration are countries or groups of countries. We assume that in a situation of international crisis, each subject faces a choice of types of behavior: active (1) or passive (0). In this chapter, we will analyze several actual international crises. We will use concepts of cooperation, conflict, and influence. We do not have objective measuring devices to determine relations and influences without ambiguity. The only available measurement is expert evaluation. In all the examples analyzed in this book, the expert is the author. Having certain knowledge about real subjects and their interactions, I use this knowledge in my evaluations. For example, it is obvious that during the Second World War, Germany and the Soviet Union were in conflict. It is less obvious, but also reasonable to believe that during the prewar months these countries were not in conflict. To evaluate their relations on the bipolar construct cooperation-conflict, one would use the term "cooperation." Other analysts may disagree. Ideally, we would stand at a white board and model the prewar situation together. As my experience tells me, the process of modeling by means of varied initial data is an effective analytical instrument. The model puts the existing information in logical order and stimulates intuitive insight.

12.1. Europe, 1941

Let us analyze international relations during the first half of 1941. The critical relations in this period were between Germany, Soviet Union, England, and USA. Prior to Germany's attack on Soviet Union, the situation can be represented by the graph in Fig. 12.1.1:

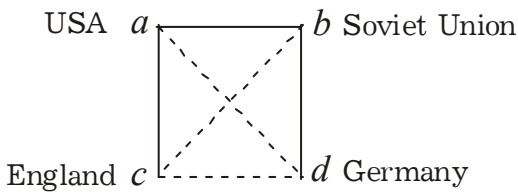

Fig. 12.1.1. Relations in 1941 prior to June 22
(first version)

Although relations between the USA and the Soviet Union were not very friendly, both parties viewed each other as a potential ally in the fight against Hitler. Then Germany and Soviet Union signed a pact of non-aggression. Hitler kept assuring Stalin that the concentration of German troops on the Soviet borders was just a distracting maneuver in the fight against England, and Stalin continued to supply raw materials to Hitler. So, in the framework of our model, we consider that Germany and Soviet Union were not in a relation of conflict. Since evaluations according to our model are binary, we say that they cooperated. England was in cooperation with USA; this alliance was vitally important for England in its struggle against Germany. Relations between England and the Soviet Union were not good: Stalin believed that England had pressured Hitler to attack the Soviet Union, and the English government saw that Stalin was helping Hitler economically. The USA supported England and was in conflict with Germany.

The graph in Fig. 12.1.1 is not decomposable, because it is $S_{(4)}$. Let us analyze each country's choices.

USA. The order of significance is as follows: England, Germany, Soviet Union. After removal of node *b*, the graph becomes

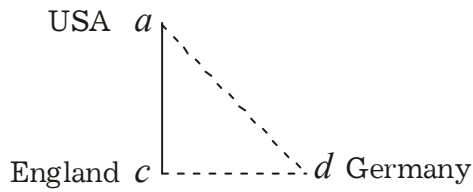

Fig. 12.1.2. Graph of relations after Soviet Union is removed

This graph corresponds to the polynomial

$$d + ac, \tag{12.1.1}$$

and the diagonal form

$$\begin{matrix} & & [a]\,[c] \\ & [d] + [ac] & \\ [d + ac] & & \end{matrix}, \tag{12.1.2}$$

and the equation for a is

$$a = d + ac. \tag{12.1.3}$$

Germany wants the USA to remain passive

$$d = 0,$$

and England pressures the USA to defend it actively against Germany

$$c = 1.$$

Equation (12.1.3) becomes

$$a = a. \tag{12.1.4}$$

Therefore, during this period, United States has freedom of choice.

Soviet Union. The order of significance is as follows: Germany, USA, England. The graph of relations after England's removal is given in Fig.12.1.3:

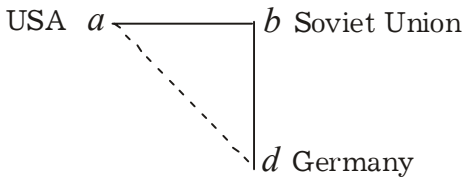

Fig. 12.1.3. Graph of relations after removal of England

This graph corresponds to the polynomial

$$b(a + d), \tag{12.1.5}$$

and the diagonal form

$$\begin{array}{c} [a] + [d] \\ [b]\,[a + d] \\ [b(a + d)] \end{array} \tag{12.1.6}$$

and the equation for b is:

$$b = (a + d)b + \bar{b}\ . \tag{12.1.7}$$

Both the USA and Germany incline Stalin toward a passive line of behavior

$$a = 0,\ d = 0.$$

Thus equation (12.1.7) appears as

$$b = \bar{b}\ . \tag{12.1.8}$$

Therefore, the Soviet leadership is in a state of frustration; this corresponds to Stalin's hesitations and lack of initiative in the months preceding the German invasion. He did not appear as an aggressor in the eyes of the USA and England and was afraid to be blamed for provoking Germany into a conflict.

Germany. The order of other countries' significance is: Soviet Union, England, USA. After the removal of the USA the graph becomes

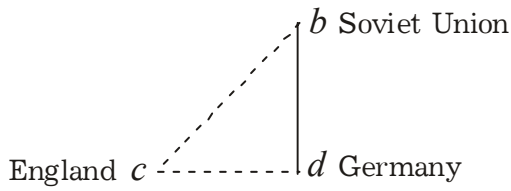

Fig. 12.1.4. Graph of relations after removal of USA

This graph corresponds to the polynomial

$$c + bd, \tag{12.1.9}$$

and the diagonal form

$$\begin{matrix} & & [b]\,[d] \\ & [c] + [bd] & \\ [c + bd] & & \end{matrix}, \tag{12.1.10}$$

and the equation for d is:

$$d = c + bd. \tag{12.1.11}$$

England appears inaccessible to Hitler and as such stimulated him to action against the Soviet Union, since the latter appears weak due to the Kremlin's indecisive policy. Thus, $c = 1$ and equation (12.1.11) becomes

$$d = 1. \tag{12.1.12}$$

Germany, during this period, followed an active line of behavior.

England. The order of significance is: Germany, USA, Soviet Union. After the removal of the Soviet Union, the graph of relations became as given in Fig.12.1.2. The equation for England is

$$c = d + ac. \tag{12.1.13}$$

Germany carried out military actions against England stimulating it to activity: $d = 1$. Equation (12.1.13) appears now

$$c = 1. \tag{12.1.14}$$

England is in an active state.

With all the given assumptions, in the period from January 1941 to June 22 the countries' states are as follows: Germany and England are active, Soviet Union is in frustration, USA has freedom of choice.

As was mentioned in the introduction to this chapter, ascribing 'cooperation' to German-Soviet relations during the prewar months is not completely obvious. Let us now ask what predictions would be given by the model, if we supposed that Germany and the Soviet Union were in conflict in that period. The graph of such relations is depicted in Fig.12.1.5.

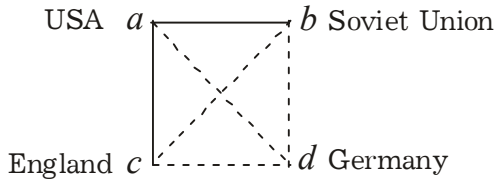

Fig. 12.1.5. Relations in 1941 prior to June 22 (second version)

This graph corresponds to the polynomial

$$d + a(b + c) \tag{12.1.15}$$

and the diagonal form

$$\begin{array}{r} [b] + [c] \\ [a]\,[b + c] \\ [d] + [a(b + c)] \\ [d + a(b + c)] \end{array} . \tag{12.1.16}$$

After transformation we obtain the equation for Germany:

$$d = d + a\bar{d} \ . \tag{12.1.17}$$

Solutions to this equation are given by the inequalities

$$1 \supseteq d \supseteq a \ . \tag{12.1.18}$$

We see that Germany's choice depends neither on Soviet influence nor on England's influence. It depends only on American influence. If the USA inclines Germany toward activity ($a = 1$), Germany will choose an active line of behavior, and if USA inclines Germany to passivity, it will have freedom of choice and may choose a passive line of behavior. Such significant German dependence on US influence, combined with the absence of any dependence on England or the Soviet Union, seems unlikely, from a historical point of view. So, the second version gives a less realistic prediction. It is based on the less likely assumption that the Soviet Union and Germany were in conflict during that period.

12.2. Hungary, 1956

The Budapest student demonstration that began on October 23, 1956, developed quickly into a general uprising against the political system established in Hungary by the Soviet Union. On October 24, Imre Nad became the leader of the revolt and the head of the country. On November 4, Soviet troops entered Budapest and suppressed the rebellion. Imre Nad was arrested and executed two years later for "high treason."

Western reaction to the "Hungarian events" was quite passive. NATO troops were not sent to Hungary; the USA produced nothing more than an accusatory declaration. The Soviet Union felt itself to be the master of the situation.

In modeling international relations during the Hungarian uprising, we will consider four subjects: Hungary, Soviet Union, USA, and Western Europe. The three subjects: Hungary, Western Europe, and the USA were in cooperation, at least morally. Soviet Union was in conflict with all of them. The graph of their relations is given in Fig. 12.2.1:

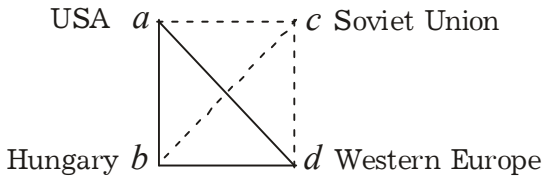

Fig. 12.2.1. Graph of relations during the Hungarian revolt

This graph corresponds to the polynomial

$$c + abd, \tag{12.2.1}$$

and the diagonal form

$$\begin{matrix} & & [a]\,[b]\,[d] \\ & [c] + [abd] & \\ [c + abd] & & \end{matrix}, \tag{12.2.2}$$

and the equation for the subjects is:

$$x = c + abd, \tag{12.2.3}$$

where $x = a, b, c, d$.
Let us construct the matrix of influences:

Table 12.2.1.
Matrix of influences

		a	b	c	d
USA	a	a	1	0	0
Hungary	b	1	b	1	1
Soviet Union	c	0	1	c	0
Western Europe	d	0	0	0	d

The USA appeals to the Soviet Union to be passive; it does not stimulate Western Europe to action, but supports the revolt in

public declarations. Soviet Union tries to calm the USA and Western Europe, but at the same time stimulates Hungary to activity by its aggression. Hungary appeals to the USA and Western Europe to become active and, by the fact of its uprising, stimulates the Soviet Union to activity. Western Europe stimulates all parties to choose a passive line of behavior.

Substitute the values of a, b, c, d from Table 12.2.1 into equation (12.2.3):

$$a = 0 + a\ 1\ 0 = 0,$$
$$b = 1 + 1\ b\ 0 = 1,$$
$$c = c + 0\ 1\ 0 = c,$$
$$d = 0 + 0\ 1\ d = 0.$$

The model shows that the USA and Western Europe choose a passive line of behavior, Hungary chooses activity, and Soviet Union has freedom of choice.

12.3. Iranian crisis, 2006

This crisis, which reached its peak in June, 2006, was connected with international apprehension over Iran's production of enriched uranium, usable for nuclear weapons. The subjects involved in this crisis were divided in two groups: Iran, China and Russia (the last two supporting Iran) on the one side, and USA, Israel and European Union (adversarial to Iran) on the other. The subjects constituting each group cooperated with each other and were in conflict with the subjects in the other group, except for European Union and Russia, who were in friendly relations at that time. The situation described corresponds to the following graph (Fig.12.3.1):

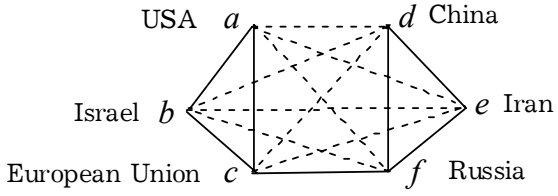

Fig. 12.3.1. Relations between the main subjects involved in the Iranian crisis of 2006

This graph is not decomposable, because its subgraph <*a*, *c*, *d*, *f*> is $S_{(4)}$.

USA. We assume that the order of other subjects' significance for USA is as follows: Iran, Israel, European Union, Russia, China. Node *d* is removed first, which results in the graph in Fig. 12.3.2:

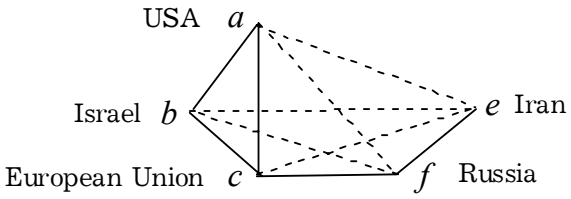

Fig. 12.3.2. Graph of relations after China is removed

This graph is not decomposable either, because its subgraph <*a*, *c*, *f*, *e*> is $S_{(4)}$. Next, node *f* corresponding to Russia is removed, and a new graph appears (Fig. 12.3.3):

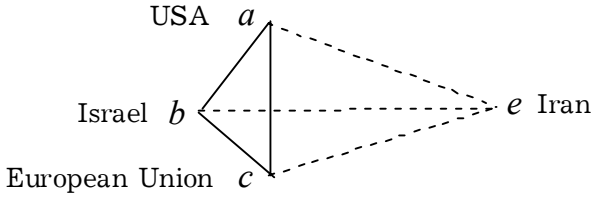

Fig. 12.3.3. Graph of relations after China and Russia are removed

This graph is decomposable. It corresponds to the polynomial

$$e + abc, \tag{12.3.1}$$

and the diagonal form

$$\begin{matrix} & & [a]\,[b]\,[c] \\ & [e] + [abc] & \\ [e + abc] & & \end{matrix}, \tag{12.3.2}$$

and the equation for the USA is

$$a = e + abc\ . \tag{12.3.3}$$

In the framework of this situation, Iran inclines USA to activity by the fact that it is preparing to become a nuclear power, so $e = 1$. This information is enough to write

$$a = 1 + abc = 1, \tag{12.3.4}$$

i.e., the United States chooses an active line of behavior.

Israel. The order of other subjects' significance is as follows: Iran, United States, Russia, European Union, China. First, node d (China) is removed and we obtain the graph in Fig.12.3.2, which is not decomposable. Next, node c corresponding to the European Union is removed:

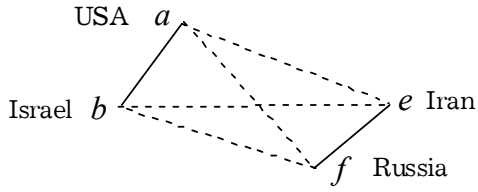

Fig. 12.3.4. Graph of relations after China and European Union are removed

This graph corresponds to polynomial (12.3.5):

$$ab + ef, \tag{12.3.5}$$

and to the diagonal form

$$\begin{matrix} [a]\,[b] & [e]\,[f] \\ [ab] & + [ef] \\ [ab + ef] & \end{matrix}, \qquad (12.3.6)$$

and the equation for Israel is

$$b = ab + ef.$$

The United States inclines Israel to passive behavior, fearing that the situation may become explosive ($a = 0$). Russia also inclines Israel to passivity, fearing a possible nuclear strike against Iran by US and Israeli forces ($f = 0$). This information is enough to determine Israel's choice:

$$b = 0, \qquad (12.3.7)$$

i.e., Israel chooses a passive line of behavior.

European Union. The order of significance is: USA, Iran, Russia, Israel, China. After node d (China) is removed, the graph (Fig.12.3.2) remains non-decomposable. Then node b (Israel) is removed, resulting in graph (Fig. 12.3.5):

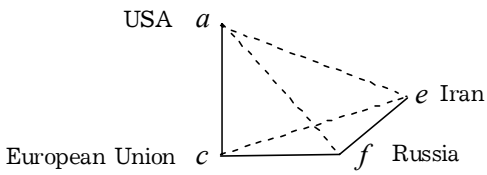

Fig. 12.3.5. Graph of relations after removal China and Israel

This graph is not decomposable, because it is $S_{(4)}$. In the next step, node f (Russia) is removed. The new graph (Fig. 12.3.6) is decomposable. It corresponds to the polynomial

$$e + ac, \qquad (12.3.8)$$

and the diagonal form

$$[a]\,[c]$$
$$[e] + [ac]$$
$$[e + ac] \qquad . \qquad (12.3.9)$$

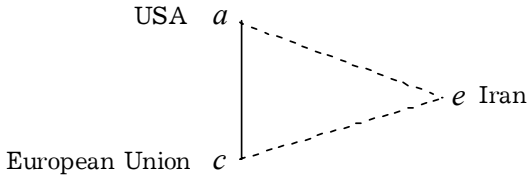

Fig. 12.3.6. Graph of relations after China, Israel, and Russia are removed

The equation for the European Union is

$$c = e + ac. \qquad (12.3.10)$$

Iran inclines the European Union toward passivity ($e = 0$), but the US urges the European Union to activity ($a = 1$). As a result, we obtain the equation

$$c = c. \qquad (12.3.11)$$

Thus, the European Union has freedom of choice.

Russia. The order of significance is as follows: USA, Iran, China, European Union, Israel. Removing Israel (node b) results in the graph given in Fig.12.3.7. The next to be removed is the European Union (node c). This results in graph (Fig. 12.3.8) which is decomposable. It corresponds to the polynomial

$$a + def \qquad (12.3.12)$$

and the diagonal form

$$[d]\,[e]\,[f]$$
$$[a] + [def]$$
$$[a + def] \qquad , \qquad (12.3.13)$$

and the equation for Russia is

$$f = a + def. \tag{12.3.14}$$

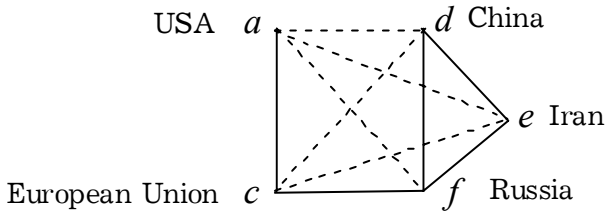

Fig. 12.3.7. Graph of relations after Israel is excluded

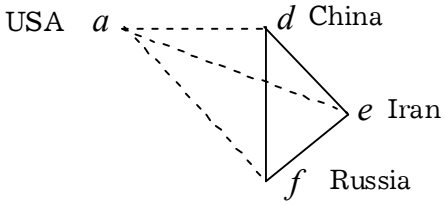

Fig. 12.3.8. Graph of relations after Israel and European Union are excluded

The US inclines Russia toward passivity: $a = 0$; Iran and China push Russia toward action in defense of Iran: $e = 1$, $d = 1$. Thus,

$$f = f\,, \tag{12.3.15}$$

Russia has freedom of choice.

China. The order of significance is: USA, Russia, Iran, European Union, Israel. China's list of significance ends with the European Union and Israel, as does Russia's list. This means that China operates with the graph in Fig. 12.3.8. The equation for China is

$$d = a + def. \tag{12.3.16}$$

The US inclines China toward passivity ($a = 0$), Iran toward activity ($e = 1$), Russia does not take steps to induce China to actively support Iran's right to conduct uranium enrichment, so we consider that Russia inclines China toward passivity: $f = 0$. Therefore,

$$d = 0, \tag{12.3.17}$$

China chooses a passive line of behavior.

Iran. The order of other countries' significance for Iran is as follows: USA, Israel, European Union, Russia, China. After excluding China and Russia, the graph of relations becomes as given in Fig. 12.3.3. The equation for Iran is:

$$e = e + abc. \tag{12.3.18}$$

European Union inclines Iran toward passivity: $c = 0$. Independently from the values of variables a and b the equation $abc = 0$ holds, and the knowledge of the European Union's influence is enough to find

$$e = e\ . \tag{12.3.19}$$

Thus, Iran has freedom of choice.

Here are the results of our analysis. During the Iranian crisis of 2006, three subjects had clear political lines: USA active, Israel and China passive. Three other subjects (Iran, Russia, and European Union) had less clearly defined policies. The model ascribed freedom of choice to these subjects.

12.4. The analysis of frustration

In this section, we will demonstrate which political processes in international relations may correspond to a state of frustration.

For a period of several years, the Palestinian terrorist organization Hamas has shelled Israeli territory. During the last few days of December, 2008, Israel attacked terrorist bases in Gaza. We will consider the situation prior to the entry of land forces into Gaza. It is depicted by the graph in Fig. 12.4.1. Note that the subjects in this situation are of different types. The US and Israel

are countries, Hamas is a terrorist organization, and the anti-Israeli forces are a group of countries and organizations acting against Israel. The USA cooperates with Israel and, in general, with anti-Israel forces, but is in conflict with Hamas. Israel is in conflict with Hamas and with the anti-Israel forces; the latter cooperate with Hamas. We will model the US choice.

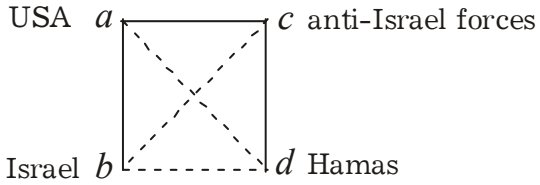

Fig. 12.4.1. Graph of relations during Israel - Hamas conflict

This graph is not decomposable, because it is $S_{(4)}$. We assume that for the US the order of significance of the subjects involved in this crisis is as follows: Israel, anti-Israel forces, Hamas. So, Hamas is excluded. The remaining three parties correspond to graph $<a, b, c>$, with polynomial:

$$a(b + c)$$

and diagonal form:

$$\begin{matrix} & & [b] + [c] \\ & [a]\,[b + c] & \\ [a(b + c)] & & \end{matrix} \quad . \qquad (12.4.1)$$

The equation for the US is

$$a = (b + c)a + \bar{a} \quad . \qquad (12.4.2)$$

Both Israel and anti-Israeli forces do not want US to be active, but their reasons are different. Israel does not want the US to stop the destruction of terrorist bases and return to fruitless process of negotiations. The anti-Israeli forces are afraid that the US may

assist Israel militarily and politically. So, both subjects incline the USA to passivity: $b = 0$, $c = 0$. Equation (12.4.2) becomes

$$a = \bar{a} . \qquad (12.4.3)$$

The model predicts that the US is in a state of frustration. How is this manifested? On December 31, 2008, *The Los Angeles Times* published the article "Behind closed doors, US seeks an exit," by Paul Richter. He wrote about the conflict between the positions of the White House and the State Department concerning the Israel - Hamas conflict. While President Bush supported Israel's right to defend itself, the State Department considered international pressure against the military campaign. We see that the influence of Israeli and anti-Israel forces generated two opposite tendencies, which resulted in the different positions of the White House and the State Department. For this reason, the US could not choose a line of behavior during the first days of the conflict.