Mafia war: simulating conflict resolution in criminal organizations

Martin Neumann
Institute for information systems,
University of Koblenz,
Universitaetsstr. 1, 56070 Koblenz;
GERMANY
Email: maneumann@uni-koblenz.de

Ulf Lotzmann
Institute for information systems,
University of Koblenz,
Universitaetsstr. 1, 56070 Koblenz;
GERMANY
Email: ulf@uni-koblenz.de

I. TARGET SYSTEM

TARGET of the model is a representation of territorial conflicts and conflict resolution in Mafia Type Organizations (MTO) [1]. Prime example is the Sicilian Cosa Nostra. The business activity of MTOs is systematic extortion of economic actors. Thereby an MTO controls a territory in a monopolistic way. Typically it offers services, most likely protection, in return and establishes a quasi-political authority over a territory. For instance, the collective organization of the Cosa Nostra controlled most of Sicily, at least the city of Palermo, in the times of its maximum power [2,3]. Currently the power of the political authority of the Cosa Nostra is in decline [4]. However, the control is divided in a number of territories which are controlled by different so-called families of the Mafia. These territories are denoted as Mandamento. The families are subdivisions of the organization which have a considerable amount of freedom of action [5]. It is a norm of the Cosa Nostra that a territory which is extorted by one family shall not be extorted by other families.

Internally an MTO is a professional organization, constituted as a strict hierarchy. It has to be noted, however, that the leadership style varies between history and different leaders. At the top is commission, the so-called cupola. The cupola coordinates activities of the Mafia families and resolves conflicts. While at the times of its constitution it was a rather democratic commission of bosses of the families, it was often likely to be dominated by one boss (the 'godfather') of the Mafia, who may be assisted by advisors [6,7]. Moreover an interprovincial commission had been established in the 1970s which formally is above the cupola. However, in practice it was dominated by the commission of Palermo [6]. The families are governed by a capo di famiglia, at the bottom level of the hierarchy are the so-called soldiers which undertake everyday business [6].

However, the structure of the organization remains fragile, dependent on mutual commitment of the influential capos to the organizational status quo. The history of the Cosa Nostra is characterized by Mafia wars in the early 1960s (with an additional peak of violence in 1969) and early 1980s. Essentially the wars were power struggles between rivaling families. The war in the 1960s broke out when drugs got lost and a certain Mafiosi had been accused of being guilty. The case came up for trial at the cupola. He was discharged, but nevertheless been killed by other Mafiosi. This undermined the monopoly of violence of the cupola and became starting point for violent conflicts [6].

II. RESEARCH QUESTIONS

The specific *target* of the model is stylized fact representation of the internal conflict resolution within the organization and its collapse in Mafia wars.

- *Research question* a) is the analysis of the micro mechanisms of stability by a stylized fact representation of the internal conflict resolution within the organization.
- *Research question* b) is the analysis of the micro mechanisms of the collapse of organizational stability in so-called Mafia wars.
- *Research question* c) is to investigate whether patterns in the outbreak of violence can be detected that characterize the organization as semi-stable system.

External relations of the MTO such as extortion and the control over a territory are treated as given facts. Shops pay unconditionally, representing an unquestioned authority of the MTO over the territory. Likewise, historical contingency such as different styles of leadership are not represented.

III. ATTRIBUTES OF THE MODEL

The simulated organization operates in a world divided in territories of different 'families'. The world is scattered with shops which provide the revenues for the organization. The model applies a stylised fact simulation to investigate effects of basic mechanisms. Space is restricted to a square which can in later stages be extended by a GIS interface of the territories of the Cosa Nostra clans in the city of Palermo. Soldiers and shops are placed randomly over the territory. The capo is placed in the middle of its territory.
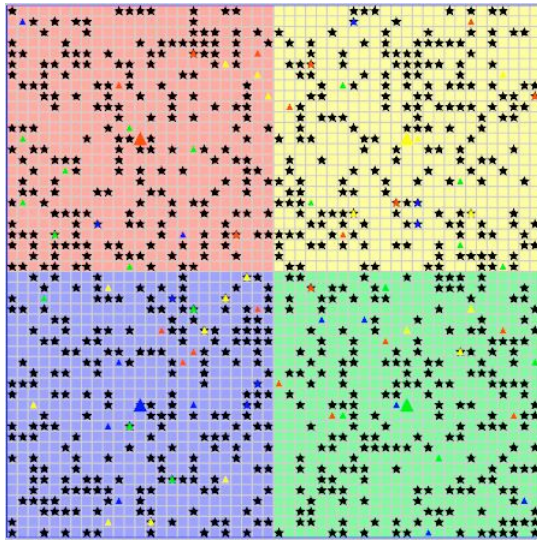
Fig. 1: The world. Different colors represent territories. The black stars represent shops. Big colored triangles are the capos, placed in the centre of their territory. Small colored triangles represent the soldiers, placed randomly in the world.

The MTO has a hierarchical structure: The bottom level of a family of the MTO consists of soldiers which undertake the extortion of the shops. A family is directed by a 'capo di familglia', i.e. the boss of a family. These are the hierarchy levels of the sub-divisions of the organization, the families. The capo knows the borders of his territory, the soldiers not. This is the most simple assumption that soldier's extortion is only tamed by sanctions. Different territories are represented by different colors. Furthermore a top hierarchy level of the overall organization represents the Mafia commission (cupola). This top level of the hierarchy above the single families is intended to resolve conflicts between families. For simplicity, one capo is selected randomly as the boss at the top level in the model. Political processes of power balance [6] are not represented. This agent has two roles: the role of a capo with a certain territory and the role of the boss (the 'godfather') of the overall organization of the MTO.

Moreover, each agent belongs to a family, which is publicly known and has a private list of friends. Friendship is reciprocal and not distributed along the line of the families or hierarchy levels. This is justified by the fact that Mafia members have friendship ties across families which became an important factor in the Mafia war in the 1980s by soldiers secretly changing sides. The friendship entails a differential degree of loyalty in case of conflicting demands.

IV. SCHEDULING

The implementation of the model follows a sequential approach: first a simple model of 'ordinary conflict resolution' has been implemented which provides the basis for an extension to include Mafia wars, i.e. first research question a) is investigated.

The process of extortion is not modeled explicitly. Soldiers walk randomly over the world. If they enter a patch with a shop they extort the shop with a certain degree of likelihood. If they extort, they gain a certain amount of extortion money from the shop. This handed over to the capo who periodically distributes the periodic income to his soldiers, while keeping a certain amount for himself.

In the initializing phase the soldiers learn to extort only inside their territory. If a soldier extorts a shop in the territory of a different family the capo sanctions the soldier. This decreases the probability that the soldier will extort a shop in the territory of this family. The action of the capo is guided by the norm 'not to extort in foreign territories'. The decision process of the capo is represented by the follow:

```
if
     mysoldier(ID-soldier)extorts
     shop(ID-shop)
     and (ID-shop) not in list(myshops)
        then
           if random-number < sanction-
           probability
sanction mysoldier(ID-soldier)
```

However, the norm is only imperfectly realized. If the income falls below a capo's threshold of satisfaction, it terminates sanctioning. In the absence of sanctions the soldier gradually forgets the norm and starts again extorting in foreign territories. At this stage the conflict resolution by the top hierarchy level becomes effective. The exploited capo complains against the exploiter. The complaint is sent to the 'godfather', who sanctions the deviant capo. In turn, this sanction increases the likelihood that the deviant capo will continue sanctioning its soldiers. This is the process of ordinary conflict resolution in the hierarchical organization.

However, it is an empirical fact that conflict resolution remains precarious and might fail. This leads to the outbreak of a Mafia war. The extension of the model to include Mafia wars is work in progress. If one of the capos constantly violates the organizational norms to a much larger degree than the other capos, a plan can made to murder the deviant capo with a certain degree of likelihood. The plan can be made by the top level boss or that capo which is mostly exploited. Also the deviant capo knows that it is in danger and might plan to murder the most likely aggressor in advance. Plans to murder are sent within the friendship network. However, it might be the case that one of the receivers of the plan has a friendship relation to the potential victim, leading to a situation of conflicting loyalties. The agent decides between two possibilities: participate at the murder or betray the conspirator. If the potential victim gets informed it generates in turn a plan of murdering the conspirator. This plan is again distributed in the friendship network of this agent [8].

Condition for the decision who initiates a war is the relative strength of the families. Strength is measured by the number of soldier. Soldiers may decide to change to another family dependent on the perceived strength of the capo. If they migrate they increase the strength of their new family. However, also the revenues need to be shared among a greater number of family members. This is an incentive to exploit new sources of income, whereas the increase in the relative strength makes it likely to win a war to gain access

to new sources of income by subordinating a territory. The murder of a capo triggers a power struggle between the soldiers. If a soldier which changed the sides becomes the new capo it subordinates this family to the other family. In this case the winning family controls the territory of the assassinated capo.

V. PRELIMINARY RESULTS

First simulation experiments with ordinary conflict resolution, i.e. sanctions by the mandamento for deviant capos verify that the model works as intended.

- Increasing the number of shops increases the revenue of the families. This decreases norm violation.
- Varying the probability with which the capo sanctions extortion of his soldiers in foreign territories reveals that this parameter determines the speed with which the soldiers learn the border of the territory.
- If the average income of the capos is above but near their threshold of satisfaction the capos start to deviate from the norm to respect the territories of the families because of the variance of the revenues. This triggers conflict escalation towards Mafia wars.

For the purpose of an extended abstract this will only be illustrated by one example of a graphical display of the results (see Fig. 2).

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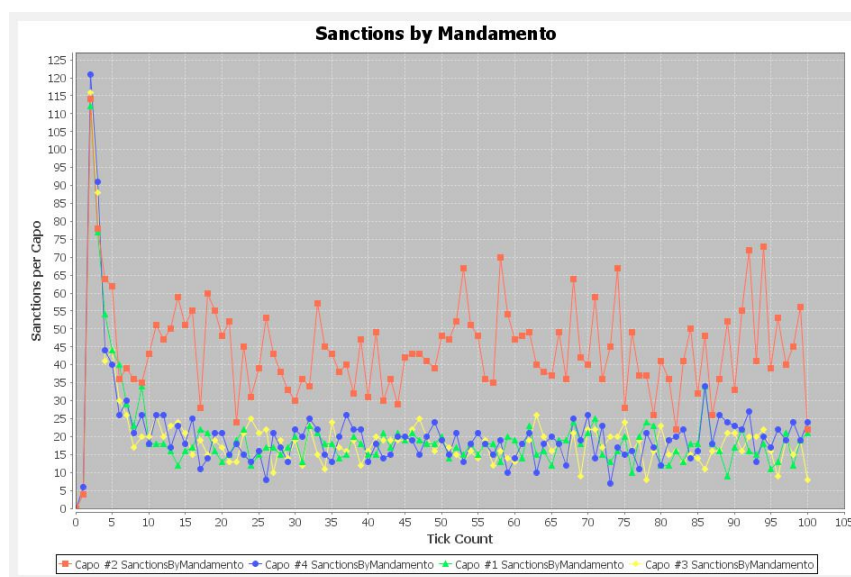[8] Arlacchi P., *Mafia von Innen: Das Leben des Don Antonio Calderone.* Fischer, Frankfurt a.M., 1992.

Fig. 2: Sanctions of the godfather to deviant capos. It can be seen that the capo of the red Mandamento (i.e. territory) constantly receives more sanctions than the other capos. This makes it likely that it will be a main actor in next war.