* The value of a particular outcome to a particular player is composed of many factors, including:
  - the benefits to the player or allies of violating without getting caught
  - the benefits when other players violate and get caught
  - the benefits and costs of false alarms
  - the costs of violating and being detected
  - the costs of other players violating without detection.

* There is no benefit or penalty explicitly given for complying with a treaty; the situation where all players comply, and there are no false alarms, has a utility of 0 for all players.

Of course other models of multilateral verification are possible; this field offers considerable scope for future research. However, the chosen model does seem to capture many of the fundamental concerns in multilateral verification.

In addition to the mathematical model, a computer simulation of the model was implemented. The Supercalc spreadsheet program was used (Supercalc is similar to the popular Lotus 123 package). Listings and displays of this program are also available in Appendix C. The spreadsheet program permits the user to specify numerical values for all possible payoffs and probabilities for a multilateral verification system involving four players. The program was useful for examining the behaviour of the model, and can be used to demonstrate all of the analytical results.

The model has a number of interesting consequences which are proven in Appendix C:

1. Even under perfect detection, some players may prefer to violate. Similarly, under no detection, some players may prefer not to violate.

These results are surprising since a basic assumption in the model is that the penalty for a detected violation is never negative, and similarly the benefit of a undetected violation is also never negative. The reason this result is true is that a player's total benefit or penalty (payoff) depends on whether the other players violate or not. If, under perfect detection, the benefit to player i of certain other players violating and getting caught is greater than the penalty to player i for violating and getting caught himself (and this same principle simultaneously applies to all violating players), then the players would jointly prefer to violate than not do so. (Similar logic applies to the case of no detection, where the benefits to player i of the other players not violating must outweigh the costs to player i of not violating). However, note that this requires a certain amount of coordination among the players: in these special circumstances it will never be in player i's *independent* interest to violate (or not violate) -- he requires others to violate (or not violate) simultaneously. (Note that in the case of no detection, such coordination is in some sense equivalent to instituting a detector.) This perspective leads to a second set of results:

2. Under perfect detection, a player acting independently will violate only when there is no penalty for getting caught violating. Similarly, under no detection, a player acting independently will violate whenever there is benefit for violation.

The significance of these results is that they emphasize a property of multilateral verification that is similar to the famous Prisoners' Dilemma of 2-person game theory. In Prisoners' Dilemma there are two generally stable outcomes, one where each player acts in his own immediate self interest, and one, preferred by both players, which requires joint action. There have been many approaches for explaining optimal behaviour in Prisoners' Dilemma; some of these could be transferred to the multilateral case. Unfortunately, co-