

or harder to detect, and some violation technologies may be more transparent than others. Also, the types and amount of information that the IAEA may draw from other sources can vary considerably.

The contribution of the analysis in this section is to establish a link between the technical variables that determine inspection effectiveness and the political considerations that determine the value ratio. This fundamental relationship will now be explored more fully, in connection with the IAEA's problem of how best to allocate inspections within a state, and across states.

### *3.2 How should inspection effort be allocated among states?*

In Section 3.1, some guidance is given in the determination of the level of inspection effectiveness, and therefore of the level of inspection effort, that should be directed against a particular state. Here, in Section 3.2, the focus is on how a fixed total amount of inspection effort should be allocated among many states. The difference in approach is important, because the sum of the inspection resource levels necessary to deter violation in each of the individual states may exceed the total available. As is demonstrated in the Appendix, this shortfall does not necessarily mean that all states cannot be deterred. And, even if it does, it is nonetheless possible to ascertain when some allocations are better than others.

In the first model analysed under Problem 2 in the Appendix, there are two states, each of which chooses to violate or not, based solely on its own interests. The model permits the states to be similar, or different, with respect to the political parameters measuring their propensities to choose violation over compliance. In other words, the model allows for variations between the states in all aspects of their value ratios.

In this model, the IAEA is also a decisionmaker. It possesses only enough resources for a single inspection, and it must choose which state to apply that inspection against. Note that the IAEA is not even allowed the flexibility to spread its inspection resources over both states — it must allocate them all to one state or the other. A further complication is that, because of differences in inspection efficiency, there may be differences in inspection effectiveness between the two states.

Thus, in this simple model there are three decisionmakers — the IAEA, which must decide which of the two states to inspect, and the states themselves, which must decide whether to violate prior to learning the IAEA's inspection plans. A complete game-theoretic solution of