

Just like the thresholds for deterring a single state, the exact position of the threshold (curved) line for deterring both states depends on the political parameters (value ratios) for both states. Details are found in the Appendix. Likewise, in order to make multiple use of a single inspection in this way, the IAEA must adjust appropriately the likelihoods that the inspection will actually be applied against each state. The IAEA may have considerable latitude in selecting these likelihoods, as discussed in the Appendix and illustrated in Figure A2.

There are good reasons to believe that the phenomenon illustrated in Figure 2 is quite general. In the second model discussed under Problem 2 of the Appendix, a similar situation occurs when there is one inspection to be used on any fixed set of states. The analysis demonstrates when a single, sufficiently effective inspection can deter all states from violating, provided the likelihoods for its use are selected appropriately.

As discussed in the Appendix, our models for Problem 2 incorporate the assumption that inspections cannot be split between or among states. Clearly this is arguable — a more general and realistic view is that, rather than scheduling inspections, what the IAEA does is to allocate inspection effort among states. However, as pointed out in the Appendix, this can only increase the feasibility of using relatively low levels of inspection effort to deter violations in relatively large numbers of states.

The contribution of the analysis in this section is to establish and illustrate the principle that, if inspection effectiveness is relatively high, then smaller levels of inspection effort are sufficient. The key is that predetermined allocation of inspection effort must be avoided. No matter what the size of the safeguards program, unpredictability in its application increases its capability of ensuring that no violations occur.

### *3.3 How should inspection effort be divided between declared and undeclared sites?*

Sections 3.1 and 3.2 provide some guidelines about how much total inspection effort should be directed against a particular state. Now the question of how inspection effort should be allocated within a state is addressed. In summary, the problem involves a state which has declared facilities, and may also have an undeclared (clandestine) program of nuclear weapons development. With respect to this state, IAEA safeguards must include not only inspection of the nuclear fuel cycle associated with declared facilities, but also efforts to detect and identify undeclared facilities and operations. These two aspects of a safeguards program are essentially