to be an SM. It is rational to be a CM only for those few who have average detection and concealment abilities. And the benefits for those at the average will be small because there will be so few other CMs ($r$ will be small).

Gauthier admits that 'to assume transparency may seem to rob our argument of much of its interest' (p. 174). He realizes that the transparency assumption robs his argument of all practical import because it is obviously false. In this case the translucency assumption corrected the problem. But to assume equality of ability to detect and conceal dispositions also robs Gauthier's argument of its interest. In this case I see no plausible response. Gauthier has failed to show that it is rational to cooperate in prisoners' dilemmas.

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## AN ECONOMIC NEWCOMB PROBLEM

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THE Newcomb problem is an imaginary example that raises important questions for decision theory. But it is not often thought to be directly a practical problem. For years, however, economists have been talking about a perfect example of the Newcomb problem, and they think it has practical significance for government policy.

The original Newcomb problem is this ([3]). On the table in front of you are two boxes. One is transparent, and you can see it contains £1,000. The other is opaque, and you know it contains either £1,000,000 or nothing. You are allowed to take and keep for yourself either the opaque box on its own, or else the opaque box and also the transparent one. However, you need to keep something in mind. The contents of the opaque box have been determined by a person who, through her great expertise in psychology, has made a good prediction of whether you will take one box or both. If she predicted you will take only one, she has put £1,000,000 in it. If she predicted you will take both, she has left the opaque box empty. The abilities of this person are well established. You know she is likely to have made a correct prediction in your case. However, she cannot now change the contents of the box before you; they are fixed. Table 1 summarizes your predicament.

What should you do? Here is one way of reasoning. If you take only one box, the predictor will probably have predicted that, so you will probably get £1,000,000. If you take two boxes, the

| | Take two boxes predicted | Take one box predicted |
|---|---|---|
| Take two boxes | £1,000 (third best) | £1,001,000 (best) |
| Take one box | nothing (worst) | £1,000,000 (second best) |

*Table 1*

predictor will probably have predicted *that*, so you will probably get only £1,000. Therefore you should take only one box. Here is another way of reasoning. Whatever the predictor has predicted, the contents of the boxes are now fixed. So, whatever she has predicted, you will get £1,000 more by taking two boxes than by taking one. Therefore you should take two. The problem is to decide which way of reasoning is right.

Now some economics. What happens in an economy depends on people's expectations of what is going to happen, because their expectations influence their actions. A theory of the behaviour of the economy therefore requires a theory of people's expectations. In recent years a theory known as 'rational expectations' has become popular. The rational expectations theory says that people's expectations are pretty much correct. What people expect to happen is what will happen, apart from some purely random errors.

Suppose the government would like to increase the level of employment in the economy. One way of doing so is to expand the money supply. However, according to a common argument (whose details do not matter here), this method will only work if the expansion is unexpected. If people expect it, they will themselves act in a way that cancels out the beneficial effects of the expansion. The only result will be inflation. On the other hand, if people expect the money supply to expand and it does not, the result will be a recession. The government's predicament is summarized in Table 2.

| | Expand predicted | Keep constant predicted |
|---|---|---|
| Expand | Inflation (third best) | Increased employment (best) |
| Keep constant | Recession (worst) | No change (second best) |

*Table 2*

What should the government do? Here is one way of reasoning. If it keeps the money supply constant, people will probably have predicted that, so the *status quo* will continue. If it expands the money supply, people will probably have predicted *that*, and there will be inflation. Therefore it should keep the money supply constant. Here is another way of reasoning. People have already formed their expectations, and they will act accordingly. Whatever they expect, the results of expanding the money supply are better than the results of keeping it constant. Therefore the government should expand it.

Clearly this is the Newcomb problem, with the people playing the role of Newcomb's predictor. In economics it is generally called 'the time inconsistency problem'. (The connection between these problems was pointed out by Frydman, O'Driscoll, and Schotter [1].) Expanding the money supply is the two-box conclusion; keeping it constant the one-box.

The discussion amongst economists has gone like this. The problem was first described by Finn Kydland and Edward Prescott [2]. These authors used it to argue that the government ought to adopt a fixed rule of keeping the money supply constant. No doubt this is true in a sense. But the question is whether the government, having adopted such a rule, would be rational to stick to it. On this, Kydland and Prescott are not very explicit. But the consensus in the subsequent discussion is that the government would be rational to break the rule once people's expectations are formed, and expand the money supply. Economists, that is to say, are two-boxers. Consequently, the discussion has focused on the question of whether a government might be able to force itself to stick by the rule of keeping the money supply constant, even at a time when it would be rational to break this rule. There is a useful survey of this literature by Persson [4].[1]

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[1] I am grateful to many people for helpful correspondence and discussions on the subject of this paper. Amongst them are: Michael Bacharach, Timothy Besley, James Hines, Paul Seabright, John Vickers and several of my colleagues in the Economics Department at Bristol.