Public Choice **85:** 189–192, 1995.

The reluctant gamesperson – A comment on Baye, Kovenock and De Vries*

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My role with respect to "efficient rent-seeking"[1] is an unfortunate one. Rather by accident, I discovered a new paradox in economics, something we emphatically don't need. Various people have attempted to abolish the paradox or demonstrate that it is not very severe. My unhappy role has been pushing the discussion "Back to the Bog".[2] Although I don't like paradoxes, I invented one and I am now defending it.

Further, this paradox is a fairly important one. I invented it in connection to rent-seeking, but any kind of competitive activity where differential capital investments give advantage raises the same problem. Thus, it is some evidence that the competitive market doesn't work very well. Needless to say, I find this unpleasant. As a result of this long debate, I am beginning to wonder if it may not be true that the competitive market does have this previously unknown defect which will make it unlikely that it will reach the efficient equilibria even if it does approximate them.

There is another problem. I was originally an enthusiast for game theory. In fact, long ago when it was a simpler subject, I taught a course in it. Now I have begun wondering whether the mixed strategy is actually a legitimate solution.[3] Perhaps Pascal was right about games of strategy and Von Neuman and Morgenstern wrong. I regret to say that these doubts are going to be part of this comment.

Baye, Kovenock and De Vries propose mixed strategy solutions for the efficient rent-seeking paradox for those cases where the exponent is two or greater. As a matter of fact, Perez-Castrillo and Verdier, have already provided a solution for those cases where it is above two.[4] It is as it turns out, a pure strategy solution, although it is not obvious that Perez-Castrillo and Verdier realized this when they first submitted their article. I called it to their attention in the course of my comment.[5] I accepted their solution, but if there was going

* He kindly explained his position to me both in letters and in conversation. The solution to the Tullock rent-seeking game when R > 2: Mixed strategy equilibria and mean dissipation rates. *Public Choice* 81(3–4): 363–380.

to be only one person playing there would of course have to be some way of deciding which one.

The only obvious method is a preclusive bid by someone and this, although it works, leads to an unpleasant equilibrium. First, people have to move quickly without giving the matter careful thought. One would therefore assume that a lot of mistakes, like the one that I mentioned in that note that cost Sony $45 million, could be expected.

In the area with an R of less that two both Perez-Castrillo and Verdier and Baye, Kovenock and De Vries have nothing very precise in the way of a solution. Above, the difference between the two solutions is that Perez-Castrillo and Verdier used a pure strategy and Baye, Kovenock and De Vries mixed strategies.

The first thing to be said here is that it is probably quite unusual in the real world where this kind of problem is approximated for R to be above two, so the solution to this particular part of the problem is not exactly of great practical importance. Still, it's a step. But in most cases in which you have competitive investments, whether it's rent-seeking or building new factories there is a sunk cost problem. Once started, you cannot get the money back, and you may be led step by step into very large investments. This is a problem which is not dealt with by either of the papers.

With regard to the first example on page 371, they solve it with the prize at $1.00. If they had been Germans, and calculated it in marks so instead of being $1.00, it was DM 1.40, the solution would have been different.

This is a question which I had never thought of before. I used the exponential form when I wrote "Efficient Rent-Seeking", because I wanted a form which showed economies of scale, and that was the standard elementary textbook method of doing it. With mixed strategies it raises very severe problems. Suppose I am playing against a German who makes all of his calculations in marks, and I make them all in dollars. We could get radically differently mixed strategies. I have to apologize for starting the discussion without even thinking about this problem. As a matter of fact I think it is much more general. I believe that most functions which are not purely linear would raise this particular problem in cross currency calculation.

Turning to mixed strategies, to repeat, I originally thought these were wonderful, and I now think they are not.[6] Further, my reason is fairly simple and straight forward. Firstly, assume that the other players in any of these games are playing the approximately calculated mixed strategies. Under these circumstances, the payoff to me for any of the pure strategies which is part of the mixed strategies, is the same. Thus, there is no reason why I should go through all the trouble of rolling dice, etc., and if I have any reason at all for playing some other number, let us say I am risk averse, it would give the same results as the mixed strategy as long as my opponents continue playing the properly calculated mixed strategy.

For example, suppose we are playing the mix of strategies at the left of the first line of page 372. By choosing 0 I avoid all risk and still have a good chance of making something. Of course, if my opponent suspects I am doing that, he has a good reply. What we have here is the paradox of the liar. If, it is assumed that the properly calculated mixed strategy is the right thing to do, then I can safely believe that other people will do it, and there is no reason why I should. On the other hand, if I have doubts about their playing the mixed strategy, then once again there is no reason why I should play the properly calculated mixed strategy. Over a short series of plays it is not even risk averse since the dice may tell me to take the most risky individual strategy. Guessing my opponents strategies will do better if I have even the most trivial ability to do so. In fact, the mixed strategy becomes simply one of the strategies in Pascal's infinite regress.

The particular set of solutions on the first line of page 372 raises another serious problem. There are two symmetric solutions. Which should I play? As Q gets bigger, there may be even more. If the two parties must agree not only which currency to use, but also which solution to play, we will have a great deal of cooperation in a non-cooperative game.

There is another problem which our authors apparently have not thought about at all. Their game strategies characteristically generate a positive value. This means that more people will want to play the game and some method must be devised to decide who shall do so. In other words, there is a preliminary game before we began playing the game whose strategies they have calculated.

This problem was discussed in my comment on Perez-Castrillo and Verdier,[7] so I need not go on here, but I should point out the result of the two games could easily result in either complete dissipation or even overdissipation, depending on the mechanism that is adopted to choose the people who will be actually permitted to play a profitable game. On the average, it should at least exactly dissipate because if it does not dissipate there remain motives for other people to enter the game.

This brings us to Ellsberg's "Reluctant Duelist"[8] in which he pointed out the only obvious reasons for playing the proper strategy from game theory standpoint, in the particular matrix which he presented, were pure risk aversion, or a feeling that your opponent is smarter than you are, and if you play a game of strategy you will get beaten. This is not only true of his game but of all games with a value of zero.

Hunt is playing poker always played games of strategy, and it turned out he was a good strategist, it was the foundation of his immense wealth. Sam

Houston, retreating slowly across Texas, in front of Santa Ana's armies, gradually trained Santa Ana to take a siesta every noon. At the San Jacinto he delivered a devastating surprise attack on the front of the Santa Ana armies across an open field in broad daylight. Neither Hunt and Houston would have been willing to adopt the mixed strategy.

There is actually little motive for even computing the properly calculated mixed strategy. There may be some potential strategies which should be totally avoided and their discovery may require calculation, but this is clearly a minor consideration. Unless you are playing a long series of games, it is not even risk averse. You may end up playing the particular strategy with the maximum risk of the whole set in any given game.

Harsanyi says in practice people normally play pure strategies rather than mixed strategies. Ex-ante neither one of two players can never know what pure strategy the other is playing, and must make some kind of probability judgment. Assuming that the other player is actually playing a mixed strategy over some finite set of possible pure strategies, is one way of doing that. It may be better than anything else.

Nevertheless, we are back to Pascal. The mixed strategy, even if properly calculated, is only one play in a strategic game. It is only if both parties are playing mixed strategies that either one can predict the outcome over a large number of games. If you want to do better than that predicted outcome you will presumably not play the mixed strategy. And remember, if the predicted outcome is better than zero, there must be a preliminary game to decide who will be permitted to play. For people who are afraid of doing worse, it is difficult to detect deviations from the appropriate mixed strategy by the other party. Thus they face a strategic calculation too. To repeat, Pascal was right.

Notes

1. Tullock, G. (1980). Efficient rent-seeking. In J.M. Buchanan, R.D. Tollison and G. Tullock (Eds.), *Toward a theory of the rent-seeking society*, 97–112. College Station: Texas A&M University Press.
2. Tullock, G. (1980). Efficient rent-seeking. In J.M. Buchanan, R.D. Tollison and G. Tullock (Eds.), *Toward a theory of the rent-seeking society*, 97–112. College Station: Texas A&M University Press.
3. See "Games and risk", *Rationality and society*, Vol. 4, No. 1, 1992, pp. 24–32.
4. A general analysis of rent-seeking games, *Public Choice* 73(3): 335–350, 1992.
5. Tullock, G. (1993). "Still somewhat muddy: A comment". *Public Choice* Vol. 76, No. 4, pp. 365–370, 1993.
6. Op. cit. EN 4.
7. Op. cit.
8. Ellsberg, Daniel, "Theory of the Reluctant Duelist" *American Economic Reviews*, Vol. 46, pp. 909–923, 1956.