

# Review of: "The Uncertainty of Fairness: a Game Theory Analysis for a Debt Mutualization Scheme in the Euro Area"

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The authors presented an interesting application of game theory in debt mutualization while including concepts such as fairness and sympathy in the game. Overall, the presentation is clear and the results are valid. I have the following suggestions for improvement.

1. In section 3.1, the authors proposed that the two parties involved in the game is (i) the European Union, and (ii) a peripheral country  $i$ . This country  $i$  is going to propose a debt mutualization scheme. I believe there is an implicit assumption here that such a country  $i$  is a representative country of the European Union, in the sense that its credit quality of the debt to be mutualized is of similar level to the average credit quality of the pool of debts from the European Union. Otherwise, some credit quality factor would need to be taken into account in the payoff function of the game.
2. Due to the implicit assumption mentioned above, the application of the results of this paper would in fact be quite limited. It cannot be applied to any countries that having credit quality above or below the European Union. It would be intuitive to believe that the European Union would be more welcome to share debt with a country with better credit quality, while more reluctant to share debt with a country with worse credit quality. I would like to know if some of the model parameters or the payoff function itself could be tuned to reflect this difference.

Some minor comments.

1. I believe that some of the typesetting of the mathematical symbols in the paper could be improved. For instance, there are some better ways to write Cartesian product than those shown on page 5, see, for example, <https://tex.stackexchange.com/questions/28150/how-can-i-get-a-big-cross-to-denote-a-generalized-cartesian-product>. Moreover, many inline math symbols are not in math mode, such as  $s$ ,  $T$  etc.
2. On page 5, what does  $\tau$  means in  $\Sigma_{\tau} = \Delta(A_{\tau})$ ? I believe  $\tau$  should be  $i$  here.
3. On page 7, what does it mean by the payoffs are small/high?
4. I found some minor typos. (i) On page 5, "and describes the probability distribution". (ii) On page 7, "if and only if  $\underline{t}$  is a Nash Equilibrium". (iii) On page 8, inequity should be inequality. (iv) On page 11, "so, for 'any  $s > 1/2$ ".

