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Hydrology and Earth System Sciences Discussions

Interactive comment on "Do probabilistic forecasts lead to better decisions?" *by* M. H. Ramos et al.

Anonymous Referee #2

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The manuscript presents an experiment held during an 2012 EGU oral session (15 minutes) on probabilistic forecasting. More specifically the audience was enrolled in a 2-round game with 6 questions, each driving to identical outcome in both rounds but with and without uncertainty information in rounds 1 and 2. The common question for all cases was if the flood control gate to flood the farmers' fields but save the city had to be opened or not. Both the ensemble mean and different combinations of answers were analyzed in order to quantify the value of the probabilistic forecasts. Authors conclude on the value of the uncertainty with a higher amount of token in the purse and a narrower ensemble when forecasts are given with uncertainty information than without it.

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Interactive Discussion
Discussion Paper

The paper is very well written and organized. The scientific question is very pertinent. The experiment design is sound and would answer the scientific question. The analysis is clear, and very well organized as well. But the limited number of cases in each round makes the overall analysis not robust. The authors rightfully caution about the conclusion by stating clearly the weak points of the overall experiment: untrained population sample, lack of training on this particular system, restricted number of cases, etc., and finally conclude on the benefit on this experiment to start developing training on probabilistic forecasts. The authors present a couple ways to look at the results and give mostly interpretations. But the paper could benefit from assessing what drives the most the value of the probabilistic forecasts, using gains and loss for example. What is driving the value of the probability forecast in this experiment:

i) learning from previous decisions : authors analyze transitions probabilities, but adding transition gains in the analysis might help.

ii) how much money left in the purse: this seems like an over-analysis based on the sample population. A few would think of it in the audience while many others (students for example) might just see at the end in how much trouble they would have been. Starting with 30,000 tokens seemed like we could afford a couple of mistakes; We were allowed to flood the town 5 times out of 6. We could just play and see what we ended up with. If we could afford only 2 mistakes for example, how different would it be? This measure of money left in the purse seems to be a proxy for a more general measure " how much variation in the cost/loss ratio would affect the decisions" which could not be answered by the experiment. This might be worth discussing though. In particular, as mentioned, having only one dimension in this experiment is simplifying the real system tremendously. It is difficult to bring the current experimental conclusion to application or generalization.

iii)patterns of the uncertainty and behaviors: close to the threshold with narrow uncertainty range or further from the threshold with large uncertainty range are associated with corresponding risk-proned or averse behaviors. That sounds very common-sense

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although this is based on a very limited number of cases.

The overall conclusion of the manuscript is that training is necessary. The paper could benefit from further discussing the question of "How much can learning and training drive the value of the probabilistic forecast?" An operational staff properly trained and highly experienced with deterministic forecasts has an implicit knowledge of the errors and uncertainties on which his decisions are made (reliability of forecast, elasticity of cost/loss ratio, etc). Those decisions might not be as good when faced with the sudden addition of uncertainty information on which he is not trained on. As the authors conclude, only training on probabilistic forecast can bring operational staff to an equivalent level. But what are we then evaluating; quality of the training or the added value of –assumed sharp and reliable- information on uncertainty?

Minor comments: Figure 3: for a clearer comparison, put the pair together (same question, answers in round 1 and round 2)

Fig 6: clarify legend – if < 0 then more losses when without uncertainty than with uncertainty, and vice versa.

Fig8: over-analysis case. Distribution of value in purse when deciding to open the gate: over-analysis because of the number of questions this is based on and because of the population sample.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 13569, 2012.