HAS DAVID HOWDEN VINDICATED RICHARD VON MISES'S DEFINITION OF PROBABILITY?

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Introduction

IN MY RECENT ARTICLE on these pages entitled "On the Possibility of Assigning Probabilities to Singular Cases: Or, Probability is Subjective Too!" (Crovelli 2009) I argued that members of the Austrian School of economics have adopted and defended a faulty definition of probability. I argued that the definition of probability necessarily depends upon the nature of the world in which we live. I claimed that if the nature of the world is such that every event and phenomenon which occurs has a *cause* of some sort, then probability must be defined *subjectively*; that is, "as a measure of our uncertainty about the likelihood of occurrence of some event or phenomenon, based upon evidence that need not derive solely from past frequencies of 'collectives' or 'classes'" (Crovelli 2009, p. 3). I further claimed that the nature of the world is indeed such that all events and phenomena have prior causes, and that this fact compels us to adopt a subjective definition of probability.

David Howden has recently published what he claims is a refutation of my argument in his article "Single Trial Probability Applications: Can Subjectivity Evade Frequency Limitations" (Howden 2009). Unfortunately, Mr. Howden appears to not have understood my argument, and his purported refutation of my subjective definition consequently amounts to nothing more than a concatenation of confused ideas that are completely irrelevant to my argument.

My reply will focus on the first three sections of Mr. Howden's paper in isolation, and a discussion of the final two sections together.

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On the Supposed "Necessity" of the Frequency Definition of Probability

The first major section of Mr. Howden's paper bears the subtitle "The necessity of a frequency interpretation for probability theory." With a subtitle as ambitious as this, one would expect that Mr. Howden would offer some sort of argument to the effect that the frequency "interpretation" is a necessity. Disappointingly, one searches in vain to find any argument whatsoever—let alone an argument indicating the "necessity" of the frequency "interpretation." It is thus unnecessary for me to reply to Mr. Howden's argument, since there is no argument to which I might reply. I will, however, reply to a few of the random ideas in the section.

First, I would point out that Mr. Howden's claim that "a priori probability distributions cannot be ascertained without verification through empirical tests" (Howden 2009, p. 2) is baldly question begging. To claim that all probabilities must be tested against experience begs the question: well, what *is* probability in the first place? The classical method for generating probabilities by assuming equal likelihood of occurrence does not rely upon "testing" or empirical "verification" of any kind. Whether or not this method for generating numerical probabilities is legitimate depends upon how we define probability. So, to assume from the outset that this method is illegitimate simply begs the question.

Another idea in this section of Mr. Howden's paper that is apparently advanced as evidence of the "necessity" of the frequency "interpretation" revolves around my reclassification of Richard von Mises's definition as a "conceptual method," rather than the definition of probability itself. In reply, I would point out that my claim was not that Richard von Mises created a "conceptual *definition* of probability," as Mr. Howden mistakenly claims (Howden 2009, p. 3 emphasis in original). On the contrary, I specifically claimed that Richard von Mises created what is best described as a "conceptual *method* for generating numerical probabilities" (Crovelli 2009, p. 10). I made this claim based upon the observation that, since relative frequencies can never be calculated for infinite or indefinite series of observations, the method people *actually* use must rely upon finite series of actual observations. And, this is precisely the point that Richard von Mises himself makes in the quote Mr. Howden cites (Howden 2009, p. 3). Mr. Howden's misunderstanding on this point ultimately leads him to attribute to my argument the idea that the relative frequency method *requires* infinite repetitions, an argument that I never made.

Mr. Howden's extremely important discussion of odds-makers in this section also deserves notice. In my paper I claimed that since bookies and

casinos are able to consistently generate accurate odds for singular events and phenomena like boxing matches this is strong *prima fascia* evidence that non-frequentist methods for generating numerical probabilities were not "meaningless," as the brothers von Mises had claimed. Mr. Howden will have none of this, and he denounces such odds as "an illusion fabricated by an odds-maker" (Howden 2009, p. 4). His reason for denying that such odds are probabilities, however, is almost embarrassingly question begging. Indeed, his evidence that such odds are not probabilities amounts to nothing more than a mistaken restatement of how bookies go about generating odds:

> [T]he odds-maker only has to have an estimate of who will win and who will lose a fight. The odds established are used to entice individuals to bet against the expected winner, in the hopes of pocketing more winnings. (Howden 2009, p. 4)

Setting aside the fact that this is not how bookies manage a sportsbook, (and setting aside the fact that Mr. Howden is here admitting that odds-makers *can indeed* accurately predict who will win a fight!), it should be obvious that it is question begging to use claims such as this as evidence that probability must be defined as a frequency. Again, the question thus begged would be: well, what is the definition of probability in the first place? To assume from the outset that the methods of odds-makers utilizing non-frequentist methods are not "exercise(s) in probability," is to assume the very thing one is attempting to prove!

In sum, despite the ambitious subtitle of this section of Mr. Howden's paper, we are not offered any argument whatsoever for the supposed "necessity" of the frequency definition of probability.

What Does Risk Have to do with the Definition of Probability?

Turning now to the second section of Mr. Howden's paper, we find errors in reasoning that rival those of the first section in their seriousness. In the first place, the section opens with a quote drawn from my paper where I made the following claim:

> [W]hen we deal with the subject of probability we must necessarily and concomitantly deal with the subject of uncertainty. The term 'probable' applies to statements and facts about which we are uncertain—the word does not apply to statements and facts about which we are absolutely certain. (Crovelli 2009, p. 7)

Mr. Howden then makes the following claim:

> That there are only two options available—complete certainty and complete uncertainty—seems to neglect the case of risk. (Howden 2009, p. 5)

At no point in my paper, however, did I ever claim that these are the "only two options available," and it is thus completely invalid to ascribe this claim to me. In fact, my claim was that there man's uncertainty varies since probability acts as a numerical *measure* of man's uncertainty about the world.

Mr. Howden then turns to what he apparently considers to be a critical concept when attempting to define probability: the concept of "risk." I am chided for not citing Frank Knight, who made a "distinction between risk and uncertainty in terms of the ability to quantify outcomes" (Howden 2009, p. 5). How Knight's conception of risk is relevant to the problem of defining probability is never explained, however. The supposed distinction between these two concepts is simply stated and then abandoned without any argument whatsoever about why it is critical for defining probability. Mr. Howden's lamentation that I did not analyze the concept of risk is thus difficult to fathom. For, if he cannot explain exactly why this distinction is important in the quest to define probability, on what basis should I be condemned for not discussing it?

It is important to bear in mind that my paper aimed to define probability. My argument that probability must be defined subjectively cannot be refuted by simply restating what the frequentists have said about the concepts of "risk" "uncertainty" "class probability" and "case probability." But this is precisely what Mr. Howden's argument, such as it is, amounts to, because he never even attempts to explain how these concepts are relevant to my argument. There is also a very serious element of circular reasoning involved in citing the frequentists' conception of "risk" and "uncertainty" *as the only evidence* that the frequentists' definition is the correct definition. The question at hand is whether the relative frequency conception of probability is correct one, and to cite their conception as the only evidence that their conception is correct is circular.

In addition, as I have previously noted, the conception of "uncertainty" that I developed in my paper has absolutely nothing to do with the idea of "complete uncertainty" (Howden 2009, p. 5). Hence, Mr. Howden's repeated condemnation of applying probabilities to things about which we are completely uncertain is nothing more than a repetitious flaying of his own straw man. To argue that subjectivists are seeking to apply numerical probabilities to things about which we are *completely* uncertain (e.g., does God have a beard?) is to completely misunderstand the debate.

In sum, the second section of Mr. Howden's paper offers only irrelevant and distracting straw men and begged questions, and absolutely no discussion of my argument.

Richard von Mises Was an *In*determinist

The third section of Mr. Howden's paper offers yet another restatement of the frequentists' conception of "collectives" and "classes." No reply on my part is necessary here, since a restatement of the frequentists' position is no argument against my position. The question at hand, after all, is whether the frequentists have a correct definition of probability, and a mere restatement of their position is no evidence whatsoever that they are right and I am wrong.

Interestingly, however, Mr. Howden attempts to bring the idea of "randomness" into the discussion in this section. He cites Richard von Mises to the effect that randomness in the world is what "necessitates the probabilistic approach" (Howden 2009, p. 8). As in previous portions of the paper, Mr. Howden does not explain how randomness is relevant to the definition of probability, but he does not seem to be aware that my entire argument rests on the claim that *there is no randomness whatsoever in the world*. In other words, my claim was that if every event and phenomenon in the world has a prior and certain cause, (and I argued that there are *indeed* causes for everything that occurs in the world), there is quite literally no such thing as randomness in the world. I claimed that if every event and phenomenon has a prior and certain cause, then the reason why man is uncertain about those events and phenomena lies in man's own mental limitations—not in some mysterious property of randomness in the world itself. I concluded from this that probability, as a numerical measure of man's uncertainty, must be defined as a measure man's subjective uncertainty. Mr. Howden seems to be unaware of all this when he cites Richard von Mises, an outspoken *in*determinist, on the topic of randomness.

Has David Howden Vindicated Richard von Mises's Definition of Probability?

The final two sections of Mr. Howden's paper offer a summary of his purported refutation of the subjective definition of probability and a vindication of the frequentist definition. The penultimate section of the paper is entitled "Probability—what is it?" In this section, one would expect to find a recap of the argument against the subjective definition, and this is indeed what one finds, in a sense. The argument, in sum, is that subjective methods cannot be applied to "collectives." That this type of argument is question begging when deployed as evidence that the subjective definition is mistaken hardly needs to be mentioned, but it is worth noting that non-frequentist methods are in fact capable of being applied to problems involving "collectives." To cite but one example, if we generate a probability of

throwing a six with a die by assuming that each side of the die has an equal likelihood of being thrown, (i.e., we utilize the classical method), this would give us a probability of 1/6. Dogmatic frequentists such as Richard von Mises would no doubt object that this number is meaningless and absurd *until* the die is actually cast many, many times, but their protestation would be based upon their *assumption* that probability must be defined as a frequency. In short, whether or not non-frequentist methods are capable of being applied to problems involving "collectives" depends upon what definition of probability we adopt.

Mr. Howden also claims that the subjective definition of probability lacks the "generality of the frequentist approach, while offering no significant advantages in replacement" (Howden 2009, p. 9). This claim is absolutely dumbfounding. In the first place, to think that the frequentists' definition of probability is more general than the subjectivists is to state precisely the reverse of the truth. It is the frequentists who condemn all attempts to quantify uncertainty that are not derived from past frequencies as absurd, and the subjectivists who allow for other methods. How the frequentists' dogmatic and virulent condemnation of other methods could be interpreted as more general is difficult to fathom. In addition, the fact that the subjective definition allows for other methods for quantifying man's uncertainty demonstrates the "significant advantages" of the subjective definition. For, the subjective definition allows for calculating numerical probabilities for singular boxing matches, singular wars, singular elections…*et cetera ad infinitum.*

In his concluding remarks, Mr. Howden sums up very nicely his entire argument against the subjective definition of probability:

> When we realize the distinction between two similar concepts—risk and uncertainty for Frank Knight, case and class probabilities for Ludwig von Mises, and collectives and unique events for Richard von Mises—we understand that probability is not something which may be redefined as Crovelli assumes. (Howden 2009, p. 10)

There is not much more to Mr. Howden's argument than that. The paper contains no argument showing that the definition of probability does not depend upon the nature of the world. There is no argument claiming that the world is not governed by time-invariant causal laws. There is no argument or explanation whatsoever as to why we must reserve the term "probability" only for those situations where we can construct a "collective." And there is absolutely no argument as to why the concept of risk obliges us to adopt a frequentist definition.

The answer to the question of whether David Howden has vindicated Richard von Mises's definition of probability must therefore be that he has failed.

References

Crovelli, Mark R. 2009. On the Possibility of Assigning Probabilities to Singular Cases, or: Probability is Subjective Too! *Libertarian Papers* 1(26): 1–17.

Howden, David. 2009. Single Trial Probability Applications: Can Subjectivity Evade Frequency Limitations. *Libertarian Papers* 1(42): 1–12.