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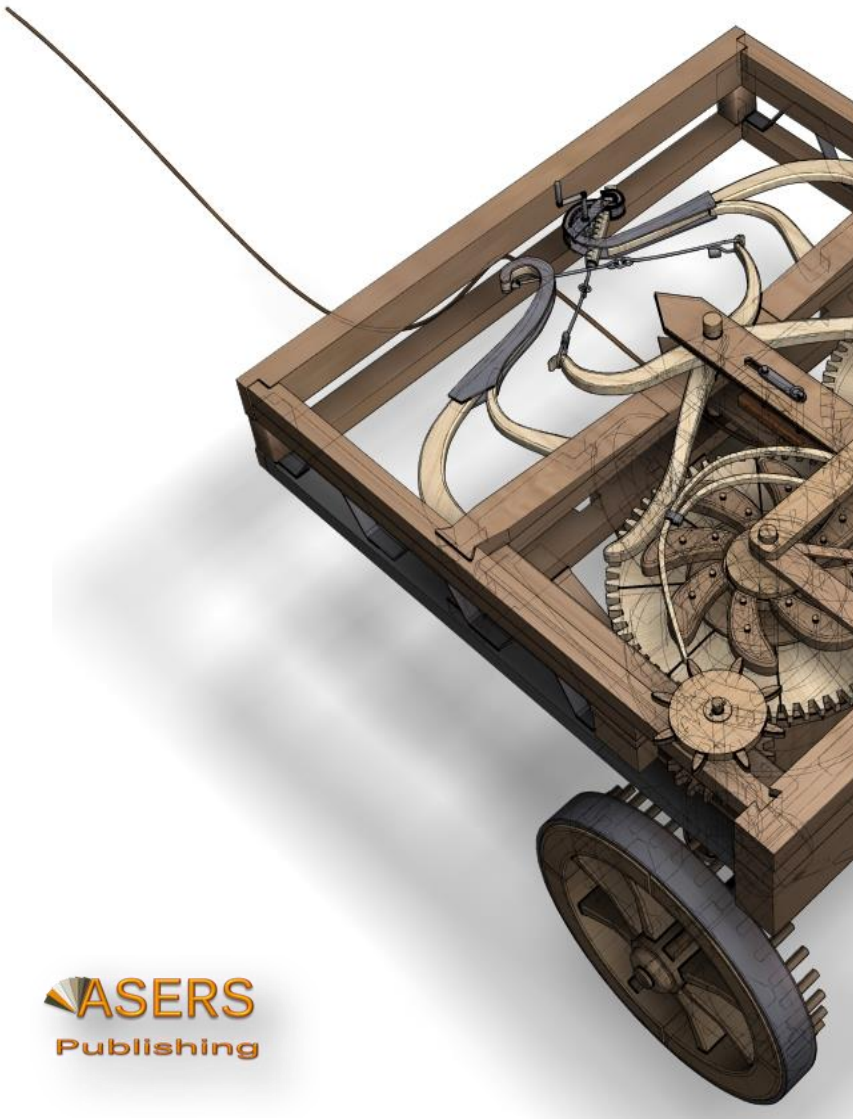

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D. E. WATT'S REPLY FOR KEYNES TO RAMSEY IN THE BRITISH JOURNAL FOR THE PHILOSOPHY OF SCIENCE IN 1989 IS DEFECTIVE

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Abstract

D. E. Watt replied to Ramsey's attacks on Keynes's Logical Theory of, as originally contained in Keynes's A Treatise on Probability, in the January 1922 issue of Cambridge Magazine, in the republished British Journal for the Philosophy of Science version.

Watt overlooks that all 15 of Ramsey's paragraphs in the original Cambridge Magazine version of the paper are erroneous. Watt concentrates only on the issue of numerical versus non numerical probabilities that was raised by Ramsey. Watt is correct in his assessment that Keynes was right and Ramsey was wrong, but gives probability answers that would not have been given by Keynes, or Keynes and Russell. Watt overlooks the errors contained in each paragraph of Ramsey's review.

Keynes's main point on the issue of numerical versus non numerical probabilities is that many probabilities, especially initial or a priori probabilities, will have to be specified by interval probability. Keynes's Principle of Indifference (POI) has nothing to do with this issue, due to Ramsey's inchoate and erroneous understanding of the conditions Keynes laid out in the A Treatise on Probability for the sound application of the POI, as enunciated by Keynes on pp.52-56, and not on p.42, which is the Laplace -Bernoulli version of the POI. Sound applications of the Keynesian POI require that the alternatives must be a) discrete, b) indivisible, c) finite, d) represented by conditional probability, e) perfectly symmetrical, and f) based on the available, positive evidence. This, of course, rules out any application to states of equally balanced ignorance (no positive information). Of course, there will be only one answer that can be calculated by all rational decision makers. The obvious example is the first Ellsberg urn problem, which is nearly identical to the problem used by Keynes as an example on pp.75-76 of his A Treatise on Probability.

Keywords: nonnumerical probability; interval probability; imprecise probability; non-additive probability; relational; propositional logic

JEL Classification: D81.

Introduction

The paper will be organized in the following manner. Part II will examine some of the obvious errors in Ramsey's 1922 paper. Of course, the errors will only be obvious to a reader of the entire *A Treatise on Probability* (TP). The general failure of readers of the TP over the last 100 years to read the entire book led to the general acceptance of Ramsey's two critiques because the vast majority of

readers simply assumed that Ramsey had to have been right in his two critiques because he was a genius. Further, Keynes himself, Ramsey's mentor, had acknowledged that Ramsey was a genius.

Part III will examine Watts narrowly focused reply to Ramsey's attack on what Keynes called non numerical probabilities. Watt gives an incomplete answer that ignores Keynes's emphasis in the TP in chapters III, Part II, chapters XX and XXII of Part III, chapter XXVI of Part IV and Chapters XXVIX and XXX on inexact and approximate measurement, which was Keynes 's terms for interval probabilities. Part IV will conclude the paper.

1. The Many Errors in the 1922 Ramsey *Cambridge Magazine* Review

Bateman gives the following description of Ramsey's 1922 review:

"Ramsey's most noticed achievement (to date) by historians of economic thought is probably the open challenge he made to Keynes's *Treatise on Probability*, a criticism that first appeared during the second ten-week term of Ramsey's second year as an undergraduate in a short review published in the Cambridge Magazine (January 1922). Keynes had postulated that probability is an objective logical relation between two propositions; Ramsey denied that any such relations existed, completely undercutting the work that had taken Keynes roughly fifteen years to bring to fruition in 1921.

How did an eighteen-year-old undergraduate have the audacity to make such a critique and how had he been able to publish it? This is the story that Paul tells so well" (Bateman 2016, 182).

The relations that Bateman refers to above are, of course, the relations between sets of propositions involving premises and conclusions that Keynes defined as his *argument* form (pp.4-6, TP, 1921). Keynes's relational, propositional logic is identical in form to the Boolean relational, propositional logic that took the world's philosophers by storm in his 1854 *The Laws of Thought* (LT).Of course, Keynes's development, implementation and application of his *argument* form to probability led to major results in Part II of the TP that went far beyond Boole's results of his application of his original propositional logic to probability in chapters XVI to XXI in his *LT* in 1854.

Let us now take a look at the first two pages of Ramsey's article in 1922.The severe nature of the obvious errors should have warned readers right away that Ramsey simply did not understand what it was he was talking about:

"First, he (author's note-Ramsey is referring to Keynes) thinks that between any two non-self-contradictory propositions there holds a probability relation (Axiom I), for example between 'My carpet is blue' and 'Napoleon was a great general'; it is easily seen that it leads to contradictions to assign the probability 1/2 to such cases, and Mr. Keynes would conclude that the probability is not numerical. But it would seem that in such cases there is no probability; that, for a logical relation, other than a truth function, to hold between two propositions, there must be some connection between them. If this be so, there is no such probability as the probability that 'my carpet is blue' given only that 'Napoleon was a great general', and there is therefore no question of assigning a numerical value."(Ramsey 1922, 3;1989, 219-220).

First, nowhere in the *A Treatise on Probability* or anything written by Keynes in his lifetime did Keynes state, write or think"… that between any two non-self-contradictory propositions there holds a probability relation…" (Ramsey1922, 3).

Only those propositions that satisfy the structure of Keynes's argument form can have a probability relation of some degree that exists between them. That means that the propositions must be related to each other **and** contain relevant knowledge connecting the two (it is more accurate to say two sets of) propositions.

Second, there is no such axiom one "…Axiom I…" (Ramsey 1922, 3) asserted by Keynes existing in the *A Treatise on Probability* or in anything else written by Keynes in his lifetime.

Third, Ramsey's "…'My carpet is blue' and 'Napoleon was a great general'…" (Ramsey 1922, 3) example is directly ruled out by Keynes's argument form ,first specified on p.4 of A Treatise on Probability ,specifying that the h proposition(s),that form the premises of the argument, must contain relevant evidence upon which to base a conclusion ,a, so that $P(a/h)=\alpha, 0 \leq \alpha \leq 1$,where α is a degree of

rational belief because there is evidence supporting the conclusion and P stands for the logical, objective, probability relation that holds between h and a. Keynes's results on pp. 54-56 rule out any connection between propositions that are irrelevant to each other .'My carpet is blue' is irrelevant to 'Napoleon was a great general' and 'Napoleon was a great general' is irrelevant to 'my carpet is blue'.

Given the fact that nothing Ramsey is talking and writing about on p.3 of his note has anything to do with Keynes's A treatise on Probability, the claim, that Ramsey destroyed and demolished Keynes's logical theory in 1922, is a claim that most likely can only be found among economists and philosophers who write about Keynes's views on probability despite never having read the *A Treatise on Probability* .How is it possible for Ramsey's review to be considered a "brilliant", "fine", "astute", and "meticulous " analysis of the *A Treatise on Probability* ?

In his July 1922 review of Keynes's A *Treatise on Probability* for the Mathematical Gazette, on page 120 in his star footnote, Bertrand Russell showed that all of Ramsey's examples of supposed logical errors are intellectually worthless because they are prevented from occurring by Keynes's relevance - irrelevance logic. They are also ruled out by Keynes's argument form requirements on pp.4-6 of Keynes's A Treatise on Probability.

It is easy to discern what Ramsey's fatal logical and epistemological errors were -his claim that Keynes's logic applies to *any two* propositions. Ramsey carries this nonsense definition through in both his 1922 article and his 1926 presentation that was published in 1931.

In fact, what one need to do to make any sense of Ramsey's definition is to replace "any two" with "some sets of". Ramsey simply invented in his own imagination that part of his definition about the 'any two' in "any two non-self-contradictory propositions…"

Fourth, Keynes would have, of course, concluded that no probability exists and not Ramsey's "and Mr. Keynes would conclude that the probability is not numerical."

Fifth, Keynes would have stated that it should be obvious that "… there is therefore no question of assigning a numerical value."

In conclusion, just concentrating on the first two paragraphs of Ramsey's 1922 review shows that he has made 5 serious errors regarding Keynes's application of his relational ,propositional logic .That should have been enough to reject Bateman's claims in 2016 about Ramsey having challenged Keynes. The most extreme claim of Ramsey's is that Keynes's propositional relations do not exist:

"But let us now return to a more fundamental criticism of Mr Keynes' views, which is the obvious one that *there really do not seem to be any such things as the probability relations he describes*. He supposes that, at any rate in certain cases, they can be perceived; but speaking for *myself I feel confident that this is not true. I do not perceive them,* and if I am to be persuaded that they exist it must be by argument; moreover I shrewdly suspect that *others do not perceive them either, because they are able to come to so very little agreement as to which of them relates any two given propositions.***"**(Ramsey 1926, [193]. In Kyburg and Smokler 1980, (2nd ed.), 27; italics added).

This quotation has been the mainstay of academicians [for example, see Bateman (1987, 1989, 1990, 2016, 2021a, 2021b), Braithwaite (1973), Misak (2020). See Arthmar and Brady (2017, 2018) for an early critique of Bateman], for over 100 years when they explain why they rejected Keynes's logical theory of probability. The quotation is based entirely on Ramsey's false belief that Keynes's theory allows any two non contradictory propositions to be analyzed. All of Ramsey's examples, in both 1922 and 1926 reviews, involves two unrelated and irrelevant propositions of the same type as used by Russell in his July, 1922 review as a counter example to Ramsey. The counter example in contained in a footnote on p.120:

"2+2 =4" and "Napoleon didn't prefer poodles "

Yes. Ramsey would be right to conclude that

"…speaking for myself I feel confident that this is not true. I do not perceive them, and if I am to be persuaded that they exist it must be by argument; moreover I shrewdly suspect that others do not perceive them either, because they are able to come to so very little agreement as to which of them relates any two given propositions."(Ramsey, ibid., 27)

when he is talking about his own very flawed examples. Yes. One can agree that there *should be* little agreement about Ramsey's incorrect example problems, such as "my carpet is green" and "Napoleon was a great general." or "This is round" and "that is red" or "This is blue" and "that is red".

I have shown in a number of other publications that there is nothing correct on pp. 4-5 of his 1922l review. (See Brady 2004a,b, 2021a,b).

3. A Demonstration that Watt Accepted too much of Ramsey's Claims as Being Scholarly

Watt attempts to focus his reply to Ramsey on only one area of the dispute between Ramsey and Keynes -whether probabilities are always numerical or whether they can be non-numerical. Keynes uses the term "non numerical" to stand for his approximate, indefinite, inexact measurement approach using two numbers, an upper probability, limit or bound and a lower probability, limit, or bound. This approach was first technically worked out by Boole in 1854. What Boole and Keynes are using are interval valued probabilities requiring two numbers and not one. The modern approach for logical probability is provided by Hailperin in 1986.See Hailperin,1965,1986,1996.

However, Watt overlooks most of the many errors contained in Ramsey's 1922 review. Consider Watt 's statement below:

"Ramsey criticizes Keynes' contention that epistemic probabilities are not always numerical, comparing him to a surveyor who, afraid that his estimates of the heights of mountains might be erroneous ... said that heights were relative to surveyors' instruments, and when he came to a mountain hidden in mist he assigned it a non-numerical height because he could not see if it were taller or shorter than the other."

This is excellent rhetoric; it is only the philosophy which is poor. In the first place, Keynes does not use the possibility of erroneous probability assignments to prove either that probability is relative to evidence, or that probability is sometimes non-numerical. The passage (in 3.12) quoted by Ramsey in paragraph 5 makes no reference whatever to the possibility of having mistaken beliefs about probability. Rather, it makes probability relative to our (limited) knowledge, and knowledge obviously does not include our mistaken beliefs. In the second place, as regards the numerical nature of epistemic 2 probability, Ramsey's analogy begs the question. It is obvious that mountains have numerical heights; …" (Watt 1989, 223-224).

Watt makes some sound rebuttals to side points here but does not realize what the main point Keynes is getting at -probability is primarily interval because of missing /unavailable evidence. This missing/unavailable evidence is due to the fact that in the surveyor, heavy cloud cover/mist example, what makes it impossible to make a precise estimate is the cloud cover, so that we must go with an imprecise estimate.

Consider the following analysis of Watt which overlooks Keynes's clearly defined argument form (TP 1921, 4-6) and Keynes's clearly presented logic of relevance-irrelevance (TP 1921, 52-56):

"In chapter 3, Keynes cites various cases in which, he claims, probability is not numerical. Ramsey prefers to analyse these as cases in which no probability relation exists (2.3). Given a particular knowledge set K and proposition p, Ramsey seems justifiably more cautious than Keynes as regards accepting the existence of any probability relation, numerical or otherwise. For instance, let K be the knowledge set of a newly born baby, and let p be Goldbach's conjecture. Is it clear that P(p/K) exists? If it does, this presumably has implications for the way a reasonable agent will regard the proposition.

But if K is the knowledge of a newly born baby, how should the agent regard p?

The answer, of course, is that the agent does not regard p at all, so the question of how he should do so does not arise. In such a case it seems idle to speak of probability. We shall say that p is 'not a hypothesis relative to K'; 'not a

K-hypothesis'. Thus in what follows the term 'hypothesis' will be reserved for those cases were some probability exists-maximal, minimal, or intermediate.

In particular cases, then, Ramsey's caution in regard to the existence of a probability relation seems justified." (Watt 1989, 224).

Watt has dropped the ball here. He does not see that Ramsey's example of a green carpet and Napoleon on p.3 of Ramsey's paper makes no sense at all. What is blinding Watt here is his belief that Ramsey was a genius. Now Ramsey eventually developed into a genius, but he obviously was NOT ONE IN 1922.The propositions selected by Ramsey are both unrelated and irrelevant.

Finally, Watt errs in choosing a problem involving Keynes's Principle of Indifference (POI) that had been ruled out of bounds by Keynes because the assumption of continuity leaves to the generation of many, different conflicting answers. Keynes's POI, as discussed on pp.52-56, is applicable to discrete outcomes only.

"In contrast to Ramsey, I suggest that Keynes' examples are evidence for the conclusion that probability is not always numerical, and indeed for the stronger conclusion (also accepted by Keynes: see 3.8) that probabilities are sometimes not even comparable; that we can have knowledge K, and K-hypotheses H1 and H2, such that P(H1/K) is neither greater than, nor equal to, nor less than P(H2 /K). I shall now offer a proof of this stronger conclusion by adapting an example from 4.6; intended by Keynes for a different purpose.

Define the specific volume of a substance as the density of water, divided by the density of that substance, and define the specific density of a substance as the density of that substance, divided by the density of water."(Watt 1989, 225).

Keynes had already shown in chapter III

"…that probabilities are sometimes not even comparable; that we can have knowledge K, and K-hypotheses H1 and H2, such that P(H1/K) is neither greater than, nor equal to, nor less than P(H2/K)."(Watt 1989, 225).

involves the use of intervals. Consider the much more simpler and straightforward example below when compared to Watt's three pages of manipulation.

We can take p1 = (.45, .55) and p2= (.50, .60) on evidence K. Then p1 is neither greater than, nor equal to, nor less than p2. See Keynes's numerous examples on pp. 22-34 of probabilities using upper and lower limits or bounds.

Watt overlooks the many other errors that permeate Ramsey's Cambridge Magazine review. There is not a single paragraph of the 15 in Ramsey's review that does not involve either complete or partial error.

Conclusions

The fundamental error committed by all 20th and 21st century academicians, who characterize themselves as being 'Keynes scholars' or 'Fundamentalist Keynesians', is their failure to read and absorb Part II of the TP. Having failed to absorb Part II, they are completely unprepared to grasp Part III, Part IV and Part V.

The bridge between Part I of the TP and Part II was Chapter V of Part I.Keynes makes it clear in a footnote on p.65 at the very beginning of chapter V that chapter V of Part I is the introduction (alpha) to Part II, particularly chapter 15(omega). Chapter 15 then leads to chapters 17, 20, 22, 26, 29, 30, and finally to chapter 32.

The republication of Ramsey's *Cambridge Magazine* article by the *British Journal for the Philosophy of Science* was a major mistake, similar to D. Moggridge's mistake as the editor of The Collected Writings of John Maynard Keynes (CWJMK) in allowing R. B. Braithwaite to publish an editorial foreword, placed at the front of the 1973 CWJMK edition of Keynes's *A Treatise on Probability*, that can only serve to severely mislead all potential readers.

The Watt response of 1989 is completely inadequate, as Watt concentrates on only one of Ramsey's many errors, which was his erroneous critique of Keynes's non numerical probabilities, by which Keynes meant that probability was primarily interval valued. Watt has no idea about what Keynes meant. His unfortunate resort to an application of Keynes's Principle of Indifference (POI) to a type of problem that Keynes made clear that his POI could not be applied to, which were problems involving continuity, demonstrates the point in a very convoluted and extensive exercise that overlooks that there

is a much, more simpler and direct example that can be used to show what Keynes was talking about, which Keynes makes crystal clear in Part II of the TP in chapters 15 and 17.

The historical result of the overwhelming acceptance of Ramsey's two reviews is that scientists, in general, erred in their belief that subjective probability was a superior foundation for issues and problems involving the use of probability and statistics in questions and problems that confront business, government and industry decision makers. Thus, what is now required, in light of the very large number of errors contained in both the 1922 and 1926 Ramsey critiques of logical probability, is a throughgoing, detailed, systematic reevaluation of Keynes' s logical theory as advanced by Hailperin.

References

[1] Arthmar, R. and Brady, M. E. 2017. Reply to Feduzi, Runde, and Zappia. *History of Economic Ideas*, Vol.XXV, 1: 224-233.

[2] Arthmar, R. and Brady, M. E. 2018. Boole, Ramsey and the Keynes-Townshend exchanges on subjective probability. *Journal of Economic Thought and Policy*, 2018(2): 55-74. https://www.francoangeli.it/riviste/Scheda_Rivista.aspx?IDArticolo=63027&Tipo=ArticoloPDF

[3] Bateman, B. 1987. Keynes's changing conception of probability. *Economics and Philosophy*,3: 97-119. DOI: https://doi.org/10.1017/S0266267100002753

[4] Bateman, B. 1989. "Human Logic" and Keynes's Economics: A Comment. *Eastern Economic Journal*, 15(1): 63-67. Available at: https://www.jstor.org/stable/40325218

[5] Bateman, B. 1990. Keynes, Induction, and econometrics. *History of Political economy*, 22(2): 359-380. DOI: https://doi.org/10.1215/00182702-22-2-359

[6] Bateman, B. 2016. Review of Frank Ramsey (Margaret Paul). *HOPE*, 48: 181-183.

[7] Bateman, B. 2021. Introduction to Symposium: Celebrating the Centenary of Keynes's Treatise on probability. *Journal of the History of Economic Thought* (December), 43(4). Available at: https://www.cambridge.org/core/journals/journal-of-the-history-of-economic-thought/article/abs/introduction-to-symposium-celebrating-the-centenary-of-keyness-treatise-on-probability/DA1DCE1E7B27406C69600A110600F1CE

[8] Bateman, B. 2021. Pragmatism and Probability: Re-Examining Keynes's Thinking on Probability. *Journal of the History of Economic Thought*, 43(4): 619-632. DOI:https://doi.org/10.1017/S1053837221000365

[9] Brady, M. E. 2021b. On the correction of all thirty-five errors contained in Ramsey's 1922 and 1926 reviews of Keynes's Treatise. *Journal of Management Information and Decision Science(s),* 24(6)(special issue): 1-19. Available at: https://www.abacademies.org/articles/on-the-correction-of-all-thirty-five-errors-contained-in-ramseys-1922-and-1926-reviews-of-keyness-treatise.pdf

[10] Brady, M.E. 2004a. *J. M. Keynes' Theory of Decision Making, Induction, and Analogy. The Role of Interval Valued Probability in His Approach*. Xlibris Corporation. (Pennsylvania; Philadelphia)

[11] Brady, M.E. 2004b. Essays on John Maynard Keynes and… Xlibris Corporation. (Pennsylvania; Philadelphia)

[12] Brady, M.E. 2021a. How SIPTA overlooked Keynes's major contributions to imprecise probability and decision making, 1999-2019. *International Journal of Management Research and Economics*, 1(3): 11-21. DOI: https://doi.org/10.51483/IJMRE.1.3.2021.11-21

[13] Braithwaite, R.B. 1973. *Editorial Foreword to A treatise on Probability*, Vol.8, CWJMK edition. London, Macmillan, pp.xiv-xxii).

[14] Hailperin, T. 1965. Best possible inequalities for the probability of a logical function of events. *American Mathematical Monthly*, 72: 343-359. DOI: https://doi.org/10.2307/2313491

[15] Hailperin, T. 1986. Boole's Logic and Probability. Amsterdam: North-Holland. 2nd edition, eBook ISBN: 9780080880051

[16] Hailperin, T. 1996. *Sentential Probability Logic*. Bethlehem: Lehigh University Press.

[17] Keynes, J. M. 1921. *A treatise on probability*. London: Macmillan

[18] Misak, C. 2020. *Frank Ramsey: A Sheer Excess of Powers*. Oxford: Oxford University Press.

[19] Ramsey, F. 1926. Truth and probability. In Mellor, D. H. (Ed.) Foundations: Essays in Philosophy, Logic, Mathematics, and Economics, London: Routledge & Kegan Paul, 1978]; Kyburg, H.E. and Smokler, H.E. (1980). Studies in Subjective Probability. New York: Wiley (2nd ed.), pp. 25-52.

[20] Ramsey, F. P. 1922. Mr. Keynes on Probability. *Cambridge Magazine*, XI, 1, (Jan.): 3-5. Reprinted in the *British Journal of the Philosophy of Science*, 40, [1989, June]: 219-222. Available at: https://www.journals.uchicago.edu/doi/abs/10.1093/bjps/40.2.219

[21] Russell, B. 1922. Review of A treatise on Probability by John Maynard Keynes. *Mathematical Gazette,* 11(July): 119-125.

[22] Watt, D. E. 1989. Not Very Likely: A Reply to Ramsey. *The British Journal for the Philosophy of Science*, (June), 40(2): 223-227.

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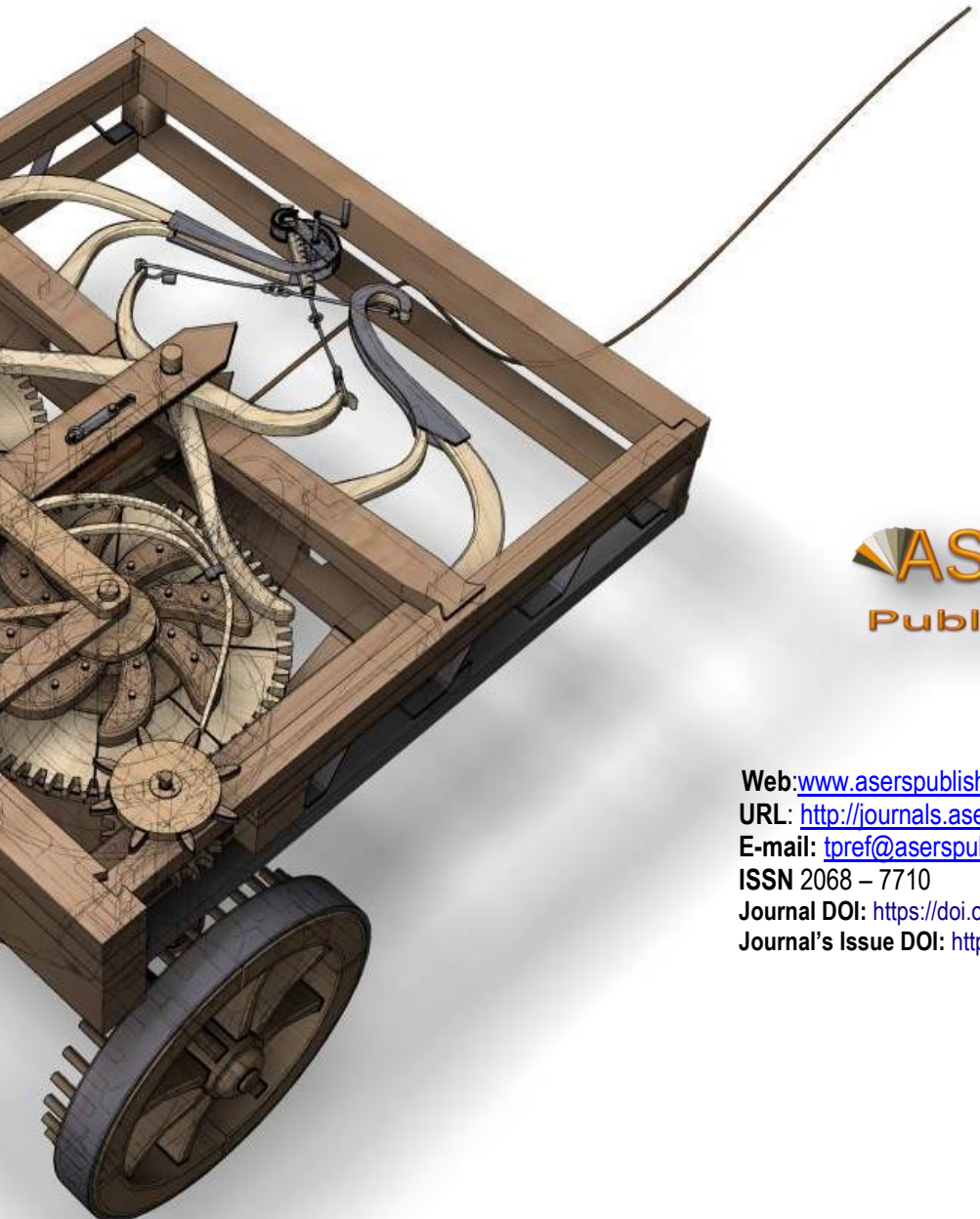

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