

Adam Smith, not J M Keynes or Frank Knight, was the First Scholar to make the Uncertainty –Risk Distinction Explicitly and Apply it Rigorously

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ABSTRACT

Adam Smith was the first academic in history to make an explicit, detailed Uncertainty –Risk distinction and apply it clearly in a number of worked out examples and applications consistently in his analysis of decision making in the Wealth of Nations on occupational choice, businesses such as mining and fishing ,taxation, and foreign trade.

Other possible claimants will be covered briefly. Only an author's published works will be considered in making an evaluation.

G. Boole, with his indeterminate (uncertainty) –determinate (risk-calculatable probabilities) approach of his 1854 The Laws of Thought, will be ranked second. Joseph Schumpeter, with his 1911 Theory of Economic Development contribution, is ranked third, while Keynes with his 1921 A Treatise on Probability, will be ranked fourth on tie breaks over Knight, with his 1921 Risk, Uncertainty, and Profit ,given that Keynes's unpublished Fellowship dissertations of 1907 and 1908 are substantially earlier than Knight's unpublished doctoral dissertation of 1916.G L S Shackle 's approach is a non probabilistic approach which ignored the much earlier work of Smith, Boole,and Keynes.

KEYWORDS: History of Economics, Economics, Marshal's Economics, Risk and uncertainty in economics.

INTRODUCTION

Adam Smith's work on uncertainty and risk, especially his identification of non proportional (non linear) risk, has been overlooked for two hundred and thirty nine years. This paper will briefly consider how this happened in the concluding section.

Section Two will consider Smith's path breaking definition of uncertainty in the Wealth of Nations (1776,WN).

Section Three will consider Smith's path breaking analysis of uncertainty and risk by covering examples of his application of uncertainty in chapter 10 of Part I in the WN.

Section Four will cover chapter 11 of Part I of the WN .

Section Five will examine Smith's use of uncertainty in his discussions of Taxation in Part V of the WN.

Section Six will briefly cover George Boole's completely overlooked contributions to the uncertainty –risk divide, J. Schumpeter's contributions as he sought to move from a static, stationary view of economic analysis to one emphasizing dynamic, inter -temporal change and innovation over time, J M Keynes's contribution that followed directly from his building the A Treatise on Probability on the work of George Boole, and Frank Knight's perspective on uncertainty. Knight's approach is the least developed of the five authors considered. Knight's view was that the existence of uncertainty does not lead to any differences in behavior when compared to behavior under risk.

G L S Shackle's approach is a non probabilistic view which completely overlooked the non additive, non linear approaches of Smith ,Boole ,and Keynes. Shackle's main thesis, that no extant approach to probability allowed for non additivity ,was simply false(See references to Shackle for further details).

SMITH'S DEFINITION OF UNCERTAINTY IN THE WEALTH OF NATIONS

Adam Smith gave a very clear, precise, and concise definition of the term uncertainty in the WN that has been overlooked:

“ That of the Yorkshire cloth, which is made altogether of English wool, is said, indeed, during the course of the present century, to have fallen a good deal in proportion to its quality. Quality, however, is so very disputable a matter, that I look upon all information of this kind as somewhat uncertain.“(Underline added by author) (Smith,1776, p.244)

Smith's statement above makes it very clear that his discussion of uncertainty does not relate to probability, but to the quality of the information being used to analyze a particular problem .On p.778 ,Smith had specified that uncertainty came in degrees. Smith is specifying that there is an intermediate degree of uncertainty in this particular instance, just like Keynes and Boole.

Smith's conception is very close to J M Keynes's specification of the mathematical variable, w , called by Keynes the weight of the evidence ,and used by Keynes in chapter 26 of the A Treatise on Probability (1921;TP) in his conventional coefficient of weight and risk, c , to denote the completeness of the relevant evidence ,information, or knowledge . w is an independent variable in the decision process that is independent of probability.

Thus, uncertainty can come in different grades ,like “somewhat uncertain”, “mildly uncertain”, ”moderately uncertain”, ”greatly uncertain”, acutely uncertain”,etc.

Smith's definition makes it clear that uncertainty has absolutely nothing to do with probability or risk. Keynes, like Smith, made this very clear in chapter 6 of the A Treatise on Probability a number of times and on p.148 of the General Theory. Uncertainty is a function of weight , which is a measure of the completeness of the relevant information ,data,or knowledge upon which the

calculation/estimation/assessment of probabilities and risk assessments/analysis will be based. Weight has nothing to do with probabilities. Uncertainty has nothing to do with unknown probabilities.

It is interesting to consider why Smith's clear cut and straightforward definition of uncertainty was overlooked by all economists, historians, philosophers, and academics for 239 years.

The best provisional answer that I have arrived at after 40 years of work on Keynes and 21 years of work on Smith is the pervasive, all powerful, influence of Jeremy Bentham's Benthamite Utilitarian approach, which is based on the claim that there is no uncertainty, since all probabilities and risks can be calculated even by madmen, on the economics profession. Bentham dominated all of England's political, social, economic, and institutional issues and debates from 1790 till 1830. David Ricardo, James Mill, J B Say, Nassau Senior, and the early John Stuart Mill, were all the students of Bentham. Thus, Smith's use of the term "uncertainty", was interpreted to mean risk. Smith was then misinterpreted as being some sort of utilitarian himself by misinterpreting his use of the terms self interest and self love. Smith came to be viewed as some sort of egoist, libertarian, or utilitarian, or combination of the three.

The failure to identify Smith's clear cut definition on p.245 of the WN has resulted in a series of misinterpretations of Smith which have been passed down over the centuries. This has resulted in what Gavin Kennedy has correctly described as "The Lost Legacy of Adam Smith". Important Smithian themes and analysis have been lost. George Stigler's claim that modern economists know much more than Smith did about economics or political economy, can't be sustained in the face of the caricature of Smith based on nonsensical claims about what he meant by the "Invisible Hand" or the assessment that Smith is a great economist because he created a systematic macroscopic whole based on his widespread plagiarism of literally dozens of 17th and 18th century writers.

SMITH'S INITIAL APPLICATION OF HIS UNCERTAINTY CONCEPT TO OCCUPATIONAL CHOICE IN CHAPTER 10 OF PART I OF THE WN

"Fifthly, the wages of labour in different employments vary according to the probability or improbability of success in them.

The probability that any particular person shall ever be qualified for the employments to which he is educated, is very different in different occupations. In the greatest part of mechanic trades success is **almost certain** (little doubt-author's insert); but **very uncertain** in the liberal professions. Put your son apprentice to a shoemaker, there is **little doubt** of his learning to make a pair of shoes; but send him to study the law, **it is at least twenty to one** if he ever makes such proficiency as will enable him to live by the business. **In a perfectly fair lottery, those who draw the prizes ought to gain all that is lost by those who draw the blanks. In a profession, where twenty fail for one that succeeds, that one ought to gain all that should have been gained by the unsuccessful twenty.** The counsellor at law, who, perhaps, at near forty years of age, begins to make something by his profession, ought to receive the retribution, not only of his own so tedious and expensive education, but of **that of more than twenty others**, who are never likely to make any thing by it. How extravagant so ever the fees of counsellors at law may sometimes appear, their real retribution is never equal to this. Compute, in any particular place, what is likely to be annually gained, and what is likely to be annually spent, by all the different workmen in any common trade, such as that of shoemakers or weavers, and you will find that the former sum will generally exceed the latter. But make the same computation with regard to all the counsellors and students of law, in all the different Inns of Court, and you will find

that their annual gains **bear but a very small proportion to their annual expense**, even though you rate the former as high, and the latter as low, as can well be done. The lottery of the law, therefore, is very far from being a perfectly fair lottery; and that as well as many other liberal and honourable professions, is, in point of pecuniary gain, evidently under-recompensed.” (Smith,1776, pp.106-107;boldface added by author) and

“The value of the risk, either from fire, or from loss by sea, or by capture, **though it cannot, perhaps, be calculated very exactly, admits, however, of such a gross estimation, as renders it, in some degree, reducible to strict rule and method.** The trade of insurance, therefore, may be carried on successfully by a joint-stock company, without any exclusive privilege. Neither the London Assurance, nor the Royal Exchange Assurance companies have any such privilege.”(Smith, 1776, p.714; boldface added by author)

The analysis by Smith above states that the odds against successful practice in the liberal arts-law fields are **at least** 20 to one .The following portion of the statement specifies an exact or precise probability :

“In a perfectly fair lottery, those who draw the prizes ought to gain all that is lost by those who draw the blanks. In a profession, where twenty fail for one that succeeds, that one ought to gain all that should have been gained by the unsuccessful twenty.”

Let S = successful , NS= not successful and P=probability. Smith first gives an example where the odds are known. The risk could be calculated. Given that the odds against success are precisely 20 to 1,we obtain

$$P(NS)/P(S)=(20/21)/(1/21)=20/1 \text{ or } 20:1.$$

However, the odds specified by Smith are not the precise 20:1 against success ,but at least 20 :1 against success. This is an interval estimate with 20:1 as the lower bound. The odds against success could be 25:1, 30:1 , 50:1 ,or even 100:1 against. This is why the value of the risk

“...though it cannot, perhaps, be calculated very exactly, admits, however, of such a gross estimation, as renders it, in some degree, reducible to strict rule and method.” (Smith,p.714)

The lower bound , however, provides us with some evidence with which to reach a decision.

The shoemaker –lawyer problem chosen by Smith has the same purpose as the Ellsberg two urn problem(the risky urn has 100 red and black balls in it to choose from, 50 red and 50 black balls ;the uncertain or ambiguous urn has 100 red and black balls ,but the decision maker does not know how many are red or black).The decision maker can calculate the point probabilities only for the shoemaker occupation ;he can calculate an interval only for the lawyer occupation.

Interval estimates are inherently uncertain because there is knowledge that is missing .It is this missing knowledge that restricts the use of the purely mathematical laws of the probability calculus. Smith understood this. Bentham never understood this. Bentham’s counter approach is to specify a rational economic calculator who is able to specify all of the “uncertainties” using single number answers and outcomes.Bentham’s rational calculator is then supposed to be able to make all decision about his future courses of action with numerical precision.

Consider the following evaluation of Smith's work By S Rashid in a 1992 HOPE article:

"If Adam Smith's analytics are of little use then perhaps it was his shrewd illustrations that served to educate future generations? There is certainly considerable truth in such a claim. There are many instances in which Adam Smith provides us with convincing illustrations of opportunity cost and of the equalization of returns in different uses. Chapter X of Book I deals with "Wages and Profit in the Different Employments of Labour and Stock." It is a beautiful exercise in tracing, for example, differences in money wages to differences in the prestige of different jobs, or of differences in profits to differences in the risk associated with different activities. Despite some occasional lapses from clarity, it is well-deserving of the praise bestowed upon it by Wakefield in 1843."

This, one of the most admired and most admirable chapters in the Wealth of Nations , is allowed on all hands to be free from error, and to contain, even now, the only complete account of the subject to which it relates.

Nor is Smith's use of such reasoning limited to this famous chapter. There is a fine development of this theme in the discussion of the relative profitability of tillage versus pasture. Corn is an annual crop, butcher's-meat, a crop which requires four or five years to grow. As an acre of land, therefore, will produce a much smaller quantity of the one species of food than of the other, the inferiority of the quantity must be compensated by the superiority of the price. If it was more than compensated, more corn land would be turned into pasture; and if it was not compensated, part of what was in pasture would be brought back into corn. The same point is also developed later." When the price of cattle, for example, rises so high that it is as profitable to cultivate land in order to raise food for them, as in order to raise food for man, it cannot well go higher. If it did, more corn land would soon be turned into pasture. And in an extended discussion of the profitability of raising cattle, which is too long to be quoted in its entirety, Smith notes both the problem of joint costs and how it affects the allocation of land.

Whatever regulations tend to sink the price either of wool or of raw hides below what it naturally would be, must, in an improved and cultivated country, have some tendency to raise the price of butcher ' s-meat . The price both of the great and small cattle, which are fed on improved and cultivated land, must be sufficient to pay the rent which the landlord, and the profit which the farmer has reason to expect from improved and cultivated land. If it is not, they will soon cease to feed them. Whatever part of this price, therefore, is not paid by the wool and the hide, must be paid by the carcase. The less there is paid for the one, the more must be paid for the other. In what manner this price is to be divided upon the different parts of the beast, is indifferent to the landlords and farmers, provided it is all paid to them.

Even though Adam Smith did not provide any explicit theoretical guidelines that are particularly valuable one cannot fail to ask—what principles did guide Smith in making the perceptive and accurate observations provided above?"(Rashid, 1989,p.14 ;See the same material in History of Political Economy, Spring,1992,24 (1),pp.129-152).

Rashid has completely overlooked the uncertainty concept that Smith is applying. Further, it is simply false that Smith's analysis deals with " ... differences in the risk associated with different activities.

Despite some occasional lapses from clarity, it is well-deserving of the praise bestowed upon it by Wakefield in 1843”.

Thus ,the answer to Rashid’s observation, that “Even though Adam Smith did not provide any explicit theoretical guidelines that are particularly valuable one cannot fail to ask—what principles did guide Smith in making the perceptive and accurate observations provided above?” (Rashid,1989,p.15), is that he go back and carefully reread Smith’s analysis incorporating an uncertainty dimension into Smith’s work. This automatically will result in the conclusion that it is impossible for Smith to have been any sort of Utilitarian.

Of course, this advice applies to practically all economists who have written on Smith over the last three centuries.

SMITH ON UNCERTAINTY EFFECTS IN CHAPTER 11 OF PART I OF WN

Smith starts his analysis in this fashion:

“Different Effects of the Progress of Improvement upon three different sorts of rude Produce.

These different sorts of rude produce may be divided into three classes. The first comprehends those which it is scarce in the power of human industry to multiply at all. The second, those which it can multiply in proportion to the demand. The third, those in which the efficacy of industry is either limited or **uncertain**(author’s underline). In the progress of wealth and improvement, the real price of the first may rise to any degree of extravagance, and seems not to be limited by any certain boundary. That of the second, though it may rise greatly, has, however, a certain boundary, beyond which it cannot well pass for any considerable time together. That of the third, though its natural tendency is to rise in the progress of improvement, yet in the same degree of improvement it may sometimes happen even to fall, sometimes to continue the same, and sometimes to rise more or less, according as different accidents render the efforts of human industry, in multiplying this sort of rude produce, more or less successful.” (Smith, 1776,p. 228)

Smith presents an analysis of this third class that is based on his definition of uncertainty:

“As the efficacy of human industry, in increasing the quantity either of wool or of raw hides, is limited, so far as it depends upon the produce of the country where it is exerted; so **it is uncertain** so far as it depends upon the produce of other countries. It so far depends not so much upon the quantity which they produce, as upon that which they do not manufacture; and upon the restraints which they may or may not think proper to impose upon the exportation of this sort of rude produce. These circumstances, as they are altogether independent of domestic industry, so they necessarily render the efficacy of its efforts **more or less uncertain**. In multiplying this sort of rude produce, therefore, the efficacy of human industry is not only limited, **but uncertain**.“(Smith,1776,pp. 234-235. Author’s underscore).

Therefore, if a decision maker were to attempt to calculate the probability of it depending upon the produce of other countries, then he would only be able to give an interval probability and not a point estimate because of the poor quality of the data . Any point estimate of the probability would be unreliable.

Continuing, we find the following analysis by Smith:

“Though the success of a particular day's fishing **maybe a very uncertain matter**, yet the local situation of the country being supposed, the general efficacy of industry in bringing a certain quantity of fish to market, taking the course of a year, or of several years together, it may, perhaps, be thought **is certain enough**; and it, no doubt, is so. As it depends more, however, upon the local situation of the country, than upon the state of its wealth and industry; as upon this account it may in different countries be the same in very different periods of improvement, and very different in the same period; its connection with the state of improvement **is uncertain**; and **it is of this sort of uncertainty** that I am here speaking.”(Smith,1776,p.235)

The attempt to estimate the probability of success of a particular day's fishing would require an interval estimate, as would be the case if one attempted to calculate the conditional probability of a particular day's fishing, given the state of improvement).

Smith continues using his concept of uncertainty when discussing the mining industry:

“In increasing the quantity of the different minerals and metals which are drawn from the bowels of the earth, that of the more precious ones particularly, the efficacy of human industry seems not to be limited, but to be **altogether uncertain**.” (Smith,1776,pp. 235-236).

Smith continues in this approach:

“The discovery of new mines, however, as the old ones come to be gradually exhausted, **is a matter of the greatest uncertainty, and such as no human skill or industry can insure**. All indications, it is acknowledged, are doubtful; and the actual discovery and successful working of a new mine can alone ascertain the reality of its value, or even of its existence. **In this search there seem to be no certain limits, either to the possible success, or to the possible disappointment of human industry**. In the course of a century or two, it is possible that new mines may be discovered, more fertile than any that have.” (Smith,1776,p. 237 ;Underscore added).

The above analysis is fairly close to some of Keynes's examples from his 1937 February, QJE article of complete or total uncertainty where it is not even possible to use an interval estimate with lower-upper limits or bound.

SMITH ON TAXATION AND UNCERTAINTY

Adam Smith had no predecessor or contemporary in the 17th or 18th century who came close to understanding that any degree of uncertainty, ambiguity, vagueness, or unclearness concerning what it was that needed to be paid by the taxpayer could generate major, negative impacts on an economy.

“The tax which each individual is bound to pay, ought to be certain and not arbitrary. The time of payment, the manner of payment, the quantity to be paid, ought all to be clear and plain to the contributor, and to every other person. Where it is otherwise, every person subject to the tax is put more or less in the power of the tax-gatherer, who can either aggravate the tax upon any obnoxious contributor, or extort, by the terror of such aggravation, some present or perquisite to himself. The uncertainty of taxation encourages the insolence, and favours the corruption, of an order of men who are naturally unpopular, even where they are neither insolent nor corrupt. The certainty of what

each individual ought to pay is, in taxation, a matter of so great importance, that a very considerable degree of inequality, it appears, I believe, from the experience of all nations, is not near so great an evil **as a very small degree of uncertainty.**(emphasis added)“(Smith 1776,p. 778)

Thus, the major goal of all tax policy should be to avoid creating any uncertainty that could result if the tax payer of not know exactly what it is that needs to be paid. Smith continues his analysis specifically applied to land taxes:

“Such a system of administration might, perhaps, free a tax of this kind **from any degree of uncertainty** (emphasis added) , which could occasion either oppression or inconveniency to the contributor; and might, at the same time, serve to introduce into the common management of land such a plan of policy as might contribute a good deal to the general improvement and good cultivation of the country.”(Smith,1776,p.784).

Again , Smith repeats what he had stated previously , that the major goal of all tax policy is to avoid creating uncertainty among taxpayers resulting from their not knowing what sum needs to be paid by the tax payer.

Smith reiterates that “The extreme inequality and **uncertainty of a tax assessed in this manner** can be compensated only by its extreme moderation ...” (Smith,1776,pp.800-801).

“In France, the stamp duties are not much complained of. Those of registration, which they call the Controle, are. They give occasion, it is pretended, to much extortion in the officers of the farmers-general who collect the tax, which is in a great measure **arbitrary and uncertain.** In the greater part of the libels which have been written against the present system of finances in France, the abuses of the controle make a principal article. **Uncertainty** (emphasis added), however, does not seem to be necessarily inherent in the nature of such taxes. If the popular complaints are well founded, the abuse must arise, not so much from the nature of the tax as from the want of precision and distinctness in the words of the edicts or laws which impose it.” (Smith,1776,p. 814).

Smith gives an example above where the administration of a particular tax in France is “...arbitrary and uncertain”. The uncertainty arises due to the fact that it is difficult to understand the specific terms being used in the tax law due to the “...want of precision and distinctness in the words of the edicts or laws which impose it.” The tax payers will lack knowledge of the meaning of the tax code.

“Such taxes, therefore, if it is attempted to render them equal, become altogether arbitrary and uncertain; and if it is attempted to render them certain and not arbitrary, become altogether unequal. Let the tax be light or heavy, **uncertainty is always a great grievance** (emphasis added). In a light tax, a considerable degree of inequality may be supported; in a heavy one, it is altogether intolerable.”(Smith,1776,p.819).

Again, Smith emphasizes that it is the uncertainty of the tax, not knowing what it is that needs to be paid under the tax law, that causes a negative impact. “...Uncertainty is always a great grievance.”(Smith,1776,p. 819).Smith next applies his concept of uncertainty to poll taxes:

“In the different poll-taxes which took place in England during the reign of William III. The contributors were, the greater part of them, assessed according to the degree of their rank; as dukes, marquises, earls, viscounts, barons, esquires, gentlemen, the eldest and youngest sons of peers, &c. All shop-keepers and tradesmen worth more than three hundred pounds, that is, the better sort of them, were subject to the same assessment, how great soever might be the difference in their fortunes. Their rank was more considered than their fortune. Several of those who, in the

first poll-tax, were rated according to their supposed fortune, were afterwards rated according to their rank. Serjeants, attorneys, and proctors at law, who, in the first poll-tax, were assessed at three shillings in the pound of their supposed income, were afterwards assessed as gentlemen. In the assessment of a tax which was not very heavy, a considerable degree of inequality had been found less insupportable **than any degree of uncertainty** (emphasis added).”(Smith,1776, p.819-820).

Smith ends his discussion of taxation by repeating his position-the knowledge of what needs to be paid must be certain. In fact, Inequality in the amount actually assessed is to be preferred to “...any degree of uncertainty”.

In conclusion, there was not a single one of Smith’s predecessors or contemporaries who, in their discussions of taxation and tax law, were in Smith’s class in terms of understanding the importance of certain knowledge regarding tax codes or ordinances or the dangers of uncertainty.

J M Keynes’s refusal to support the early to mid-1940’s James Meade – Abba Lerner- Alvin Hanson theoretical approach to cutting/raising income taxes (rates) counter cyclically follows the same type of uncertainty based reasoning originally made by Smith in 1776, although Smith never dealt with income taxes because there were no income taxes in Smith’s time.

SMITH WAS THE FIRST TO CLEARLY MAKE THE UNCERTAINTY VERSUS RISK DISTINCTION AND APPLY IT RIGOROUSLY

The current belief among economists that J M Keynes and/or Frank Knight were the first to explicitly consider the role and impact of uncertainty in an economy is simply false. Adam Smith was the first by a long shot .No predecessor or contemporary of Smith comes close to Smith in this regard.

The second place slot goes to George Boole, upon whom Keynes built his logical theory of probability. No economist in the 20th century had any idea whom Boole was or what he had accomplished except for J M Keynes.

Boole is the first to clearly explain the difference between indeterminate and determinate probabilities, as well as explaining the difference between indeterminate and imprecise probabilities. The failure to grasp the importance of Boole’s work ,as regards Keynes’s logical theory of probability, easily explains the massive confusions create by current writers on Keynes’s logical theory of probability and/or his logical theory of probability, such as Robert Skidelsky .

Joseph Schumpeter takes third place. In his monumental Theory of Economic Development (TED), he clearly differentiates between risk and uncertainty. Schumpeter discussed two kinds of risk. The first dealt with internal production failures in a firm itself and the second with business failure in the market place (Schumpeter,p.33).On the other hand, uncertainty involves a lack of sufficient knowledge upon which to base one’s decision:

“... development in our sense is a distinct phenomenon, entirely foreign to what may be observed in the circular flow or in the tendency towards equilibrium. It is spontaneous and discontinuous change in the channels of the flow, disturbance of equilibrium, which forever alters and displaces the equilibrium state previously existing.” (Schumpeter,1911,p. 64;see also p.66). And

“..the success of everything depends upon intuition, the capacity of seeing things in a way which afterwards proves to be true... The more accurately, however, we learn to know the natural and social world, the more perfect our control of facts becomes, and the greater the extent, with time and progressive rationalization, within which things can be simply calculated, and indeed quickly and

reliably calculated, the more the significance of this function (author's note-the entrepreneurship function)) decreases."(Schumpeter,1911,pp. 85-86).

Schumpeter's point is that only as we move toward the limiting point of complete and certain knowledge can rational calculation a la Bentham be made by the entrepreneur. Schumpeter applies his uncertainty concept repeatedly in chapter VI of TED.

J M Keynes developed his uncertainty versus risk concept from the work of Boole. Keynes made the interval valued probability concept into the foundation for his logical approach to probability. Keynes's "conventional coefficient of weight and risk,c " from chapter 26 of the TP(1921) is a much shorter and easier way of dealing with issues of weight and uncertainty. On p.148 of his General Theory (1936), Keynes defined Uncertainty as a function of weight alone."The conventional coefficient of weight and risk,c " then becomes " the conventional coefficient of uncertainty and risk,c,"for use in the GT.

Keynes mistakenly ignored Schumpeter's contribution .It cost him dearly as the combined intellectual might of Keynes and Schumpeter combined might have accomplished a real revolution in economic theory by completely overthrowing the Benthamite Utilitarian position that decision makers can accurately and reliably calculate the expected values and/or expected utilities.

F. Knight clearly understood the risk versus uncertainty distinction as regards the issue of having or not having accurate and reliable knowledge upon which to base one's future decisions. Unfortunately, when confronted with the first of Ellsberg's two urn ball models, one urn with a known number of black and white balls and a second urn with unknown numbers of black and white balls, Knight argued that the decision maker would be indifferent between the two urns. Of course, this means that uncertainty does not have any real world impact.

CONCLUSION

This paper establishes overwhelming evidence that (a) Smith was the first to make the uncertainty versus risk distinction and (b) that there was no one, be it a predecessor, contemporary ,or successor of Smith ,who was close to Smith until Keynes published his TP in 1921.

Smith stands alone in the 18th century as a two eyed, intellectual giant surrounded by intellectually blind, utilitarian economists.

REFERENCES

(1986). Boole's Logic and Probability. Amsterdam: North-Holland. 2nd edition.

(1996). Sentential Probability Logic. Bethlehem: Lehigh University Press.

(2004a). J. M. Keynes' Theory of Decision Making, Induction, and Analogy. The Role of Interval Valued Probability in His Approach. Philadelphia, Pennsylvania: Xlibris Corporation.

(2004b). Essays on John Maynard Keynes and Philadelphia, Pennsylvania: Xlibris Corporation.

Ashraf, N. , Camerer ,C. ,and Lowenstein. F.(2005). "Adam Smith, Behavioral Economist", Journal of Economic Perspectives,19,no.3,pp.131-145.

Bentham, Jeremy. (1787).The Principles of Morals and Legislation. Nabu Press. NY; NY

Bentham, Jeremy. (1789).Defense of Usury. Kessinger Publishing, pp.1-74.

- Boole, George. (1854). *An Investigation of the Laws of Thought on Which are Founded the Mathematical Theories of Logic and Probability*. New York: Dover Publications, [1958].
- Brady , Michael Emmett and Arthmar,Rogério.2012.Keynes,Boole, and the Interval approach to Probability. *History of Economic Ideas*, 20,3, pp.65-84.
- Brady, Michael Emmett and Arthmar, Rogério. (2010).A Road Map for Economists, Logicians, Philosophers ,Mathematicians, Statisticians, Psychologists and Decision Theorists Seeking to Follow the Mathematical Structure of Keynes’s Approach to Specifying Lower and Upper Bounds for Probabilities in the *A Treatise on Probability, 1921 (1973)*.Available at SSRN: <http://ssrn.com/abstract=1618445>.
- Buchan, James (2006). *The Authentic Adam Smith: His Life and Ideas*. New York: W.W. Norton and Company.
- F. P. Ramsey. In *Essays in Biography, CWJMK* (pp. 335-346), vol. X, London: Macmillan for the Royal Economic Society (reprinted from *The New Statesman and Nation*, 3 October 1931).
- Greenspan ,Alan (2004).”Risk and Uncertainty in Monetary Policy” ,*American Economic Review*,Vol.94,no.2,May,pp.33-40.
- Hailperin, T. (1965). Best possible inequalities for the probability of a logical function of events. *American Mathematical Monthly*, 72, 343-359.
- Hansen, P. et al. (2000). Probabilistic satisfiability with imprecise probabilities. *International Journal of Approximate Reasoning*, 24, 171-189.
- Hansen, P., Jaumard, B. & de Aragão , M. P. (1993). *Boole’s Conditions of Possible Experience and Reasoning under Uncertainty*. Relatório Técnico, DCC-12/93.
- Introduction by John E. Elliott,January 1, 1982 .New York; Transaction Publishers (Original publication in German in 1911).
- Kennedy ,Gavin (2012).The Myth of the Invisible Hand-A View from the Trenches. Paper presented at the 44th Annual UK History of Economic Thought Conference-Keele University,4 September 2012.
- Kennedy, Gavin (2009). “Adam Smith and the Invisible hand: From Metaphor to Myth”, *Economic Journal Watch*,Vol.6,no.2,May,pp. 239-263.
- Keynes, J. M. (1921). *A Treatise on Probability*. The Collected Writings of John Maynard Keynes (CWJMK) vol. VIII. London: Macmillan, 1973.
- Keynes, J.M. (1921). *A Treatise on Probability*. London: Macmillan.
- Keynes, J.M. (1937). “The General Theory of Employment”. *Quarterly Journal of Economics* 51:209-223.
- Keynes, J.M. (1972). *Essays in Biography*. Vol. X, The Collected Writings of John Maynard Keynes (CWJMK), D. Moggridge (ed.). London: Macmillan.
- Keynes, J.M. (1964). *The General Theory of Employment, Interest and Money*, New York: Harcourt, Brace and World.
- Klein, Daniel B. (2009).”In Adam Smith’s Invisible Hands: Comment on Gavin Kennedy”, *Economic Journal Watch*,Vol.6,no.2,May,pp. 264-279.

Klein, Daniel B. and Lucas, Brandon (2011). "In a Word or two, placed in the middle: The Invisible hand in Smith's Tomes", *Economic Affairs*, Vol.31,no.1,pp.43-52.

Klein, Daniel B. and Lucas, Brandon (2011). "On the Deliberate Centrality of An Invisible Hand: Reply to Gavin Kennedy, Ryan Hanley and Craig Smith", *Economic Affairs*, Vol.31,no.2,pp.90-92.

Knight, F. (1921). *Risk, Uncertainty, and Profit*. New York; Dover.

Meeropol, Michael (2004). "Another Distortion of Adam Smith: The Case of the "Invisible Hand". Working Paper Series, no.79, Political Economy Research Institute, U. of Massachusetts, Amherst.

Moore, G.E. (1903). *Principia Ethica*. Amherst, New York: Prometheus Books(1988)

Mossner EC, and Ross IS. eds.(1987) *The Correspondence of Adam Smith (Glasgow Edition of the Works and Correspondence of Adam Smith)*. London; Liberty Fund, Inc.

Rashid, S (1989). *Adam Smith and the Market Mechanism: Seemingly unrelated Contemporaries*. Faculty Working paper No.89-1580, University of Illinois, Urbana-Champaign, p.14 ; See the same material in *History of Political Economy*, Spring, 1992, 24 (1), pp.129-152.

Russell, B. (1930). "Probability and Fact", *Atlantic Monthly* 146, pp. 163-170.

Russell, B. (1931). "Review of Ramsey", *Mind*, 40, pp. 476-482. Reprinted in Russell, 1996.

Russell, B. (1932). "Review of Ramsey", *Philosophy*, 7, pp. 84-86. Reprinted in Russell, 1996.

Russell, B. (1959). *My Philosophical Development*. Unwin Book: London.

Russell, B. (1996). *Collected Papers of Bertrand Russell*. Unwin: London

Savage, L.J. (1971). "Elicitation of Personal Probabilities and Expectations." In *The Writings of Leonard Jimmie Savage*. American Statistical Association and Institute of Mathematical Statistics, 1981. Washington, D.C. pp. 565-614.

Schumpeter, Joseph A.(1934). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle (Social Science Classics Series)* Paperback .

Shackle, G L S . (1939). "Expectations and Employment". *Economic Journal*, Vol.49, No.195, pp. 442-452.

Shackle, G L S. (1949). "A Non-Additive Measure of Uncertainty". *Review of Economic Studies*, Vol.17, No.1, pp. 70-74.

Shackle, G L S. (1983/84). *The romantic mountain and the classic lake: Alan Coddington's Keynesian Economics*. *Journal of Post Keynesian Economics*, Winter, Vol. 6, Issue 2, pp .241-246.

Shackle, G.L.S.(1984). *Comment on the papers by Randall Bausor and Malcolm Rutherford*. *Journal of Post Keynesian Economics*, Spring, Vol. 6, Issue 3, pp 388-394

Skidelsky, R. (1992). *John Maynard Keynes, Volume II: The Economist as Saviour 1920-1937*. London: Macmillan.

Skidelsky, Robert, (1983). *John Maynard Keynes: Hopes Betrayed (1883-1920)*. Vol. I. London: MacMillan

Smith, Adam.(1759;6th ed.,1790).The Theory of Moral Sentiments. New York: Forgotten Books,2015)

Smith, Adam.(1776).The Wealth of Nations. Modern (Cannan) Library Edition with the foreward by Max Lerner.N.Y.,N.Y.

Stove, D. (1967). John Maynard Keynes. In Edwards, P. (Ed.), Encyclopedia of Philosophy, vol. 4.