# Theorising Risk and Uncertainty in International Relations: The Contributions of Frank Knight

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# Theorising Risk and Uncertainty in International Relations: The Contributions of Frank Knight

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## Abstract

Frank Knight was one of the twentieth century's most illustrious economic thinkers. His writings and enquiry into the nature of method, theory and knowledge in relation to the activities of social actors, and under what circumstances and with what limitations we might adequately theorise social agency, bequeathed a rich tradition of theoretical and practical insight. Many of his writings centred on the issue of risk and uncertainty, how social actors anticipate the future and manage and mediate terrains of uncertainty and risk, and in doing so change the outcomes that obtain. Knight's contributions essentially constructed a means for assessing and measuring risk in various facets of social activity, seeding insights which remain pertinent today. As the article notes, however, despite Knight's insights and the methodological schema he constructed for probability analysis, remarkably few social sciences – including international relations – have mined his work. Ironically, much that we need to know to more effectively theorise and accommodate the conundrums of risk and uncertainty into social scientific methods Knight long ago handed down to us.

## Keywords

Frank Knight, probability, risk, risk measurement, uncertainty

## Introduction

When Donald Rumsfeld ruminated over the difficulties of prosecuting the War on Terror, he confessed to reporters that:

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> the truth is, there are things we know, and we know we know them — the known knowns. There are things we know that we don't know — the known unknowns. And there are unknown unknowns; the things we do not yet know that we do not know.[1]

Rumsfeld's statement spoke to an enduring problem endemic to the conduct of foreign affairs – decision-making under conditions of *uncertainty.* In theatres of war it constitutes the greatest of all enemies, the 'fog of war', where the unknown and/or uncertain attributes of enemies makes force deployment and the commitment of precious military resources a high-risk calculation. Military strategists throughout the millennia have faced this dilemma: second-guessing the motives, calculations, reasoning, capabilities and likely actions of opponents and, through agile mental arithmetic, imagining futures and scenarios where possible actions, events or interventions might outmanoeuvre rivals. Such games are played out in the mind's eye and involve a complex assessment of known facts, discounting those facts thought less reliable, calculating how the contours of distant realities might be imagined and assessed by opponents, while anticipating the response of rivals to these imagined futures as a means of gauging what one's own course of action should be. To the victor go the spoils of war, to the vanquished the weight of history.

That history should be decided by such calculations explains both its capricious ebbs and flows and our inability to accurately predict the future. While many might interpret this an outcome of luck, fortune or the perils of reckless behaviour, it more obviously represents a habit unique to humankind: the process of peering into the future, anticipating events yet to transpire and, on the basis of these imagined futures, making decisions and deciding on courses of action to intercept realities before they emerge. Such calculations are the gist of all social actors; they make history and explain its dissonant and myriad forms.

For Frank Knight, such a predilection spoke not only to the fallibility of human beings but, more importantly, to the limits of knowledge. For Knight, humankind was captive to a self-evident peculiarity: the inclination to think, act and position ourselves in relation to events and processes referenced in the future, while tending to discount or ignore those of the past and present. Strangely, Knight observed, despite the great advances in rationalist epistemologies and the mass reservoirs of scientific knowledge produced, human thought and action is defined as much by a consciousness of the future as by a prescience of the past. Much of our thinking, Knight insisted, was a function of anticipatory futures: a complex chess game of possibilities yet to emerge informing courses of action and decisions before they have happened. As conscious beings we strive perennially for knowledge of the future.[2]

Knight's insights spoke to a recurrent problem in scientific enquiry of how social agents think and act and on what information and under what conditions they premise their calculations. How rational can 'rational man' be if he bases his deliberations on facts that cannot be known or on realities which do not currently exist? Indeed, without a rational calculation of action, to what extent can scientific precepts be applied to social actors at all? Random subjectivity, serendipity or the thought traits of countless actors forever engaged in futurist navel-gazing might well be the constitutive elements that confine knowledge of social processes and actors to passive description beyond theory or predication.

It is, of course, easier to assume away such confusing flotsam and jetsam and embrace instead, neat and rationally, precise epistemologies able to impose order, clarity and explanatory consistency. As Knight well recognised, however, doing so would be to render unlikely meaningful explorations into the social world and make improbable progress in social enquiry. Fairly obviously, the messy prognostications of actors are what drive history: they populate the market place, the corporate boardroom and the mind of the political strategist and infuse our daily individual thinking. Corporate strategy, by definition, is formulated in anticipation of the actions of competitor companies which may or may not materialise. Individually, we decide to enrol in a course of study on the basis of future perceived career opportunities, or decide against courting a prospective partner having anticipated that the relationship will fail in the future. Markets themselves are driven by such calculations. The equity market, for example, is the raw expression of this carnal disposition to base current decisions on perceived futures. When we invest in the stock market we draw little on the abundance of factual information about the historical performance of equities – time-series valuations, dividend yields, beta volatility measures and price-to-earnings ratios. Rather, we base our decisions almost exclusively on an imagined future and the anticipation of unrealised events affecting the value of the equities concerned.

Peering beyond the here and now and understanding the complex interstitial relations of events yet to transpire and how human agents plan to interface with these and thus change the circumstances that obtain, was, for Knight, the primary task of the social scientist. Within this triangulated time-space dimension, he argued, knowledge ultimately resided.

## Knowing the future: *Risk, Uncertainty and Profit*

Knight was not the first to recognise the conundrums of this perennial search for knowledge of the future. Social and political theorists like Weber, Durkheim, Marx and Hegel had each postulated the vast expanse of social agency which made problematic definitive conceptions of pure knowledge or a teleology of history's trajectory. But while many had pondered these dilemmas as abstract philosophical problems, Knight was the first to make this ontological assumption his starting point, nesting in economic theory a seed which spoke to its absolute limitations as a science of rational calculation. For Knight, the disposition of human consciousness to '*perceive* the world before we act to it, and react not to what we perceive, but always to what we *infer*', defined the limits of the rational universe.[3] We are and remain, Knight insisted, creatures of anticipation.

For Knight, the problem of course rested in constructing this knowledge of the future and understanding the attributes that shape its constitution as well as the limits of its accuracy. Knight famously captured the essence of this dilemma in his opus dictum, *Risk, Uncertainty and Profit* (*RUP*), widely celebrated for its explorations into the elemental problem of a future knowledge constrained by inference, perception and anticipation. It was these, Knight argued, that defined the space in which humankind is forced to think and act – always under conditions of *uncertainty*. For Knight, this was the great conundrum. It posed for the social scientist specific problems associated with the acquisition of theory knowledge and, more importantly, spoke to the absolute limits of this knowledge as a means of predicting and understanding human behaviour.

## Risk, probability and uncertainty

Knight's ingenuity was his ability to understand the agility of concepts readily employed but little theorised. Three key concepts seem to suffer such a fate in the social sciences and, more importantly, seem to capture assumptions about the causal relationship between subjective social processes and objective phenomena: *risk*, *uncertainty* and *probability*. Each implies a different knowledge-set but, in the social sciences, have been treated ubiquitously as if all could be captured through measurement and subject to rational processes of calculation in respect of the frequency of their recurrence, the underlying causality responsible for their generation, and the magnitude of their impact on the phenomena being observed. Knight rejected this outright, and changed the discourse on risk for ever. Risk, probability and uncertainty, he insisted, were entirely different creatures:

> Uncertainty must be taken in a sense radically distinct from the familiar notion of Risk, from which it has never been properly separated... It will appear that a *measurable* uncertainty, or 'risk' proper... is so far different from an *unmeasurable* one that it is not in effect an uncertainty at all.[4]

Knight's principal contribution thus rested in his disentangling the concepts of risk and probability from that of uncertainty. A great deal of *RUP* is devoted to the analytical articulation of these concepts. While uncertainty, for Knight, represents the Achilles heel of social enquiry – both the problem to investigate *and* the obstacle to greater knowledge and understanding – risk, chance or probability, in contrast, lend themselves to statistically based analyses and thus application in all facets of actuarial and probability-based research: the modern bedrock of the insurance and finance industries. As Knight well demonstrated, however, the precision of these knowledge instruments had also to be problematised.

### *Knightian risk*

Risk, for Knight, arises from the objective observation of events and phenomena, from observable causalities whose frequency, severity and magnitude of impact or consequences can be reasonably assessed. It is a *measurable* entity whose magnitude can be inferred through formal inductive logic. For Knight, risk is tangible and quantified through the calibration of observable facts with the frequency of their recurrence. Knight invokes the famous example given by Von Mangoldt of the bursting of champagne bottles, to argue his point.

In the eighteenth century the production of champagne was not for the faint of heart. Wide variation in the manufactured quality of glass bottles made for explosive situations. As wine is mixed with sugar and yeast the fermentation process releases large amounts of carbon dioxide into the wine and pressure in the bottle slowly builds to 80–90 pounds per square inch: about three or four times the pressure in a car tyre. Not surprisingly, in the early years of champagne production imperfect bottles tended to explode with great frequency, in some instances producing now legion stories of large chain reactions through the inappropriate storage of bottles which led to huge financial losses.

As Von Mangoldt and Knight observed, however, the fact that bottles of champagne exploded frequently did not itself introduce an uncertainty or hazard into the production of champagne 'since in the operations of any producer a practically constant and known proportion of the bottles burst'. The rate of failure of champagne bottles is thus known and 'the loss becomes a fixed cost in the industry and is passed on to the consumer, like the outlays for labor materials or any other'.[5]

The point was that bottles of champagne exploding was a contingent risk, the magnitude of which could be calculated through observation, the costs associated with a certain percentage of the bottles failing were factored into the price of the bottles that survived, and thus the costs of production were underwritten. Contingent risk, in this instance, is a risk that is not certain or even necessarily probable, but as Knight famously observed 'if the numerical probability of its occurrence is known, conduct in relation to the situation in question may be ordered intelligently' (*Risk,* p.213). In other words, contingent risks could be compensated for or mitigated in terms of their impact on the actors concerned.

These definitional principles of risk we now recognise as the bedrock of the insurance industry. No one, for example, can know if a particular building will burn to the ground and few businesses operate on a scale that would allow them to calculate the fixed cost represented by fire. The insurance industry, however, does operate on such a scale. By aggregating contingencies it is able to calculate the fixed cost fire represents to a particular industry. On the basis of these calculations, insurance products can be offered to business operators, converting the contingency cost of fire into the fixed cost of the insurance product that is then passed on to the consumer. As Knight notes, it makes no difference 'whether the grouping of cases is effected through a mutual organisation [a business association, for example] of the persons directly affected or through an outside commercial agency'.[6]

In the modern era, of course, it has been the advent of a commercial insurance industry that has enabled the conversion of contingent risks into fixed costs and catapulted the ability of industry, commerce and individuals to manage so many of the risks they face in everyday life. Insurance aggregates the contingent risks of large numbers of people or organisations and thus enables them to enjoy the advantages provided by the law of large numbers (LLN). The LLN essentially expresses the idea that in a random process, as the number of trials increases, the percentage difference between the actual and expected outcomes approaches zero. As Peter Bernstein expresses it, what the LLN 'tells us is that the average of a large number of throws [of a coin] will be more likely than the average of a small number of throws to differ from the true average by less than some stated amount'.[7]

While a seemingly innocuous observation, for the insurance industry, and indeed for those of us who use commercial insurance products, the LLN represents one of the great revolutions in the management and mitigation of contingent risk. It not only provides a greater variety of monetised instruments to compensate for and manage risk exposure but at a cost to the end-user that diminishes relative to the size of the contingent risks each of us face. In essence, the LLN enables the insurance industry to manage the risk exposure it faces with greater certainty. It allows insurers to increase the accuracy of the expected deviation from probabilities concerning their risk exposure within a given business segment or population and, in a competitive insurance environment, allows for

more accurate risk pricing of insurance products. The LLN thus represents a kind of economy of scale for the insurance industry that, because of the spread of the cost of contingent risks among numerous actors, reduces the relative cost to the end-user. In the modern era, the management of contingent risks has thus never been cheaper for the individual actor or as profitable for the insurer.

While, however, the LLN makes the insurance industry possible, it also defines the outer limits beyond which insurance cannot operate. It requires, for example, that 'the risks insured must be both large in number and independent of one another', but, more importantly, that the insured phenomena be amenable to rational calculation.[8] By definition, as Knight recognised, only contingent risks are amenable to rational calculation:

> If in a certain class of cases a given outcome is not certain, nor even extremely probable, but only contingent, but if the numerical probability of its occurrence is known, conduct in relation to the situation in question may be ordered intelligently.[9]

In practical terms this limits the provision of insurance to areas where the prospects for loss can be calculated or at least the contingent costs of insurance exposure can be reasonably estimated. It also limits the provision of insurance to phenomena that are non-relational. Insurance, for example, can be offered against theft but never where theft is related to the activities of the policy-holder. Likewise, insurance can be offered against the risk of fire, flood, accident, loss of life, disability, or instances of malfeasance or misfeasance, but not against the risk that a book will fail to become a bestseller or that the colour red will be the winter season's new fashion trend.

As Knight and others recognised, however, just because risks are contingent this does not always render their calculation easy. Contingent risks are more often opaque than transparent, and measuring their occurrence and frequency is fraught with numerous technical problems. Disentangling instances of arson from acts of negligence, oversight, mechanical malfunction, lightning, or mishap and accident in the case of fire, for example, involves all manner of calculations, assumptions, interpretation and inference. Similarly, calculating the contingent risks to shipping presents numerous challenges in terms of the contingencies of weather at various points along a ship's route, the time of year passage occurs, the unpredictability of sudden weather-related events, the possibility of rogue waves and damage to the vessel and cargo, and the relationship of these factors to the build of the vessel, the manner of its operation, the possibility of navigational error and the expertise and experience of its crew.[10]

As Knight observes, even in instances of contingent risks, much of what we do relies conspicuously on the measurement of 'uncertainty through the classification of instances'.[11] In the case of the shipping industry, for example, the Lloyds Register of Shipping is essentially little more than a medium for classifying the build attributes of a ship: its hull capabilities and its onboard equipment with reference to its design specifications and confirmed through periodic independent inspections. Lloyds of London uses this information as a means of assessing and classifying the seaworthiness of a vessel and its likely ability to handle all manner of weather and ocean related events – the contingent risks a ship may encounter, in other words. Lloyds of London or any other insurer would find it too difficult, if not impossible, to assess the fixed cost to the

vessel operators. Instead, they rely on 'the classification of instances' rule as a means of correlating the build attributes of a ship, the equipment it has onboard, and the training standards of the crew as a means of calculating the *probability* that the vessel can navigate safe passage through the world's oceans. The classification of instances thus allows Lloyds of London to correlate the frequency of loss of a certain class of vessel and to price insurance based on a ship's attributes rather than having to identify specific contingent risks the vessel might encounter over its ocean-going life. Insurance companies, Knight observed, had stumbled across a practical and parsimonious method for converting the uncertainty of various risk events (weather, rogue waves, navigational error, etc.), and the uncertainty of their distribution through time, into a simple yet highly effective tool for calculating the probability of their occurrence, and thus allowing all manner of risks to be managed. Indeed, it was the subjection of risk events to probability analysis that, for Knight, offered the most effective way forward and defined implicitly an avenue down which all risk analysis must travel.

## *Knightian probability and the classification of instances*

Like the insurance industry, Knight too understood the problem of ascribing specific values to contingent risks and that for many such risks direct sense observation was impractical as a means of determining their frequency and severity. Von Mangoldt's bursting champagne bottles, for example, easily allowed the identification of what Knight termed 'an association between predicates' where risk in champagne production reflected simply a relationship between the quality of the glass bottles produced, the fermentation process and the breakage rate. As Knight observes, however, 'it will be evident that the practical difficulties of ordering conduct intelligently are enormously increased where … [risk causality] … is contingent rather than being positive'.[12] What happens when the causal factors responsible for generating risk are only occasional, or where the 'demonstration of a dependable connection is vastly more difficult', or where, for example, there is the additional problem of 'ascertaining the precise proportion of cases in which the connection occurs'?[13] Lung cancer, for example, can be correlated to smoking, but smoking does not ensure the development of lung cancer, and lung cancer can occur in the absence of a history of smoking. The 'association between predicates', in the case of lung cancer, is vastly complicated by a plethora of factors. It is obviously difficult, if not impossible, to observe all correlates or the chain of causality represented by them.

Knight's solution to the apportionment of values in ascertaining risk is to turn to probability as a means of calculating the possibility of outcomes: 'We have to estimate the given factors in a situation and also estimate the probability that any particular consequence will follow from any of them *if* present in the degree assumed.'[14] To do so, Knight developed a classification 'scheme for separating three different types of probability situation' – a priori, statistical and estimated.[15]

## *A priori probability*

A priori probabilities are derived deductively. The roll of a dice, for example, has a one in six chance of a particular number coming up. Games of chance where defined

parameters exist for certain outcomes to ensue are what Knight meant by a priori probabilities. The outcomes have a defined universe, but the order in which they will occur can only be estimated in relation to its (one in six) probability of occurrence for each throw of the dice.

What is unique about a priori probability for Knight, then, is that it speaks to a defined classification of instances. The risk outcomes are known and there is no possibility of deviation from these save for nefarious activity in terms of rigging the dice. A priori probability represents an 'absolutely homogeneous classification of instances' and, for Knight, 'is on the same logical plane as the proposition of mathematics' inasmuch as 'the chances can be computed' through the application of general principles.[16]

## *Statistical probability*

As mathematically precise as a priori probability might be, its ultimate limiting factor is that this type of probability is practically never met with in social, political and economic activity. It is, Knight observed, difficult to think of a business hazard in which it is 'possible to calculate in advance the proportion of distribution among the different possible outcomes'. In the absence of a defined universe of outcomes the types of risk businesses face must be dealt with by 'tabulating the results of experience'.[17] Knight refers to this form of 'tabulation' as *statistical probability* which he defines as the 'empirical evaluation of the frequency of association between predicates' but which are 'not analysable into varying combinations of equally probable alternatives'.[18]

'The main distinguishing characteristic of this type [of probability] is that it rests on an empirical classification of instances.'[19] Where the universe of outcomes is not defined, Knight's suggestion for dealing with the exigencies of social and economic risk was parsimonious: define categories of risk through classifying experiential instances and then tabulate the frequency of like instances as a means of calculating their probability for recurrence. In doing so, much if not most of the risks businesses face, Knight insisted, could be reduced to a fair degree of certainty. The process of statistical grouping, in other words, while it would not necessarily reveal patterns, would generate frequencies and thus a means of calculating their nominal probability.

For Knight, statistical probability provided the one concrete tool for dealing effectively with common forms of risk endemic in social and economic activity – indeed for helping business and economic actors to plan for risk contingencies. But, as Knight acknowledged, statistical probability is limited by its inability to gain the same 'degree of homogeneity in the instances classed together' as in, for example, a priori probability. The throws of a dice represent a situation of absolute homogeneity where each throw is perfectly comparable and identical to any other throw of the dice. By contrast, in the case of statistical probability the classification of instances relies on a statistical grouping of phenomena that are not strictly homogeneous. Classifying buildings in order to understand the probability of fire, for example, relies on a statistical grouping of buildings and building types that by definition are dissimilar. The problem of defining groups as accurately as possible thus reduces the nominal accuracy of statistical probability.[20]

Classifying instances is thus fraught with an obvious tension – the need to form statistical groupings in order to generate meaningful probabilities about the frequency of

recurrence while logically confronted by the reality that no two things are exactly alike.[21] As Knight suggested, however, this is a relative and graduated problem that represents a kind of sliding scale from highly homogeneous to highly heterogeneous. The flooding of domestic households, for example, makes for a relatively homogeneous classification of instances in terms of the predicates that cause flooding and the resultant outcomes. Domestic burglaries, by contrast, make for a less homogeneous classification of instances, since security measures vary widely between households and the contents peculiar to them and the value attached to each are dissimilar. Both are amenable to statistical probability analysis, but the degree of homogeneity is graduated.[22]

Actuaries, of course, strive constantly to compensate for statistical errors by imputing coefficients to allow for differences that are frequently or always present in classes of instances. But again this issue for statistical probability limits its absolute accuracy.

## *Estimated probability*

Both a priori and statistical probability make possible the management of risk in terms of defining the possible universe of outcomes and nominally calculating their probability to recur. But what if the universe of outcomes *cannot* be defined? What if the circumstances that obtain are so unique or the outcomes so infrequent that it is meaningless to tabulate experience as a measure of their probability? Or, what if there is no way to classify instances because they are strictly non-comparable or represent such a complex degree of interrelated contingencies that attempts to isolate the variables responsible for causality are meaningless? Knight refers to this type of probability situation as *estimates*. For Knight, the distinction is that 'there is *no valid basis of any kind* for classifying instances'.[23] Instead, all that we have at our disposal to understand this universe of uncertainty is to generate *estimates*. Knight's third probability situation thus returns to the problem of *uncertainty* as distinct from risk, where in the absence of a universe of probable (statistical probability) or known outcomes (a priori probability), we are forced to make a 'judgment of probability' (estimated probability) and infer a universe of possible or likely outcomes.

For Knight, of course, situations of estimated probability comprise the vast bulk of our social and economic universe. Much of what we confront and do in life falls to this form of calculation. Knight uses a common business example to highlight his point. Consider, he says, a manufacturer contemplating expanding their business. To do so they will have to expend more resources, perhaps acquire additional debt, increase the size of the production facilities and hire more people. These costs can be readily calculated, but what of the calculations about the viability of this course of action? Will added capacity depress returns or initiate a price war with competitors? Will the income stream generated by the additional capacity be enough to service the increased costs of the additional hiring, the factory expansion and the higher debt service? What if interest rates go up, or new market entrants with lower operating costs emerge? Will the economy and demand for the product remain strong? Will competitors move production offshore and undercut retail pricing?[24]

As Knight asks, 'what is the "probability" of error... in the judgment' of the manufacturer deciding to expand production?[25] Obviously, he notes:

> it is manifestly meaningless to speak of either calculating such a probability *a priori* or of determining it empirically by studying a large number of instances. The essential and outstanding act is that the 'instance' in question is so entirely unique that there are no others or not a sufficient number to make it possible to tabulate enough like it to form a basis for any inference of value about any real probability in the case we are interested in. The same obviously applies to … most conduct and not business alone.[26]

The point is that the manufacturer does in fact perform a type of probability analysis about the viability of their chosen course of action but also forms an estimate of the likely probability that their estimate is correct.[27] Knight was not discounting the value of estimates, but attempting to highlight that even in circumstances when the universe of outcomes cannot be known, attempts to delineate a universe of *potential* outcomes through rational calculation is possible, albeit subject to higher error probabilities.

For many, however, estimates undoubtedly appear an inferior or at least a problematic means for calculating potential outcomes because of their subjective nature and indeterminate means of measurement. Knight both accepts and rejects this interpretation. Individuals by their very circumstances, he insists, must deal with an uncertain universe. Attempting to eliminate uncertainty, or at best reduce it to risk by developing estimates, Knight sees as a perfectly valid and rational human response.[28] Individuals do so by invoking as objective an assessment as possible of the known facts, imagining future ones, weighting these and then applying rational precepts to anticipate possible outcomes.[29] Hardcore scientists might object to such calculations on the basis of non-verifiability, but this does not refute the notion that such estimates are made using objective criteria and calculation. Knight thus sees estimates as integral means of managing uncertainty and a highly effective cognitive strategy for mapping the future.

For Knight, the only anomalous situation is the extent to which individuals thrive on uncertainty and use it as a means of creative engagement in economic and social activity. It is the variegated response to uncertainty that 'accounts for a large part of the phenomena of current economic life'; it is the *gestalt* that inspires the creation of business systems, management processes and production ingenuities – all designed to counter uncertainty.[30] Uncertainty, in other words, drives serendipity and multifarious outcomes through agential reactions to it. The profundity of this standpoint is not lost on Knight: he recognises it as marking the outer limits beyond which science and positivist epistemologies lose their explanatory veracity. In the face of uncertainty, agential authority made Knight profoundly sceptical of the idea of developing objective tools for predicting human action or of developing methods of appraisal that would substantially reduce the probability of error in calculating uncertainties.[31] Agential interpretations of, and reactions to, uncertainty, combined with the myriad ways individuals seek to interface with future situations before they materialise in order to alter the circumstances that obtain, were altogether too complex a set of phenomena and too contingent on interpretive discretion to be reduced to accurate calculation. Prediction, in other words, was beyond the realm of the economist. The implications of this are profound. For Knight, it limited the ability of economics to become a science. Predicative accuracy or the development of tools for the precise management of economic and social affairs would forever remain beyond the reach of the economist.

## Assessing Knight's contributions to theorising risk and uncertainty

When Keynes wrote that 'it would be foolish, in forming our expectations, to attach great weight to matters which are very uncertain', Knight had reason to be bemused. For Knight, Keynes misses the point when he states that 'it is reasonable … to be guided to a considerable degree by the facts about which we feel somewhat confident, even though they may be less decisively relevant to the issue than other facts about which our knowledge is vague and scanty'.[32] But for Knight, herein lies the problem: what we know with some degree of certainty is mostly unimportant, because its ability to be imputed into calculation and subjected to scientific manipulation renders it intelligible. This quota of knowledge is of course necessary, but *marginal*. The larger and thus more significant quota of knowledge rests in the realm of *uncertainty*. It is in this environment that we formulate strategy, and engage in exercises and actions calculated through perceptions and inferences of an uncertain future. Understanding human action – the composition, reflexive social landscapes and thus activities that propel change and construct social and economic orders – rests ultimately on understanding the role of *uncertainty* in rational action.[33] It was here that Knight made his greatest contributions to risk discourse. These contributions fall into three categories.

### *A graduated risk – uncertainty schema*

The first is Knight's development of an analytical framework that makes precise the definitional parameters that separate risk from uncertainty. Knight essentially associates risk with *a priori* and *statistical probability* type situations and uncertainty with *estimated* probability type situations. Apart from providing a sophisticated heuristic device, Knight bestowed a powerful typology by which to understand the role of risk and, more importantly, the mediums through which to *assess* the likelihood of its recurrence. Knight's conception of statistical probability and the classification of instances rule, for example, laid the path for social scientists to develop risk forecasting tools and for generating meaningful probabilities about the frequency of risk generation.

Despite the heuristic utility of this graduated risk–uncertainty schema, however, Knight paid little attention to enunciating what he identified as its most dominant element – *uncertainty.* As a category supposedly endemic to all forms of human conduct, Knight had little to say about possible modes of evaluation, mechanisms for its management and/or mitigation, or indeed the constitutive elements that comprise uncertainty. Instead, Knight reifies the role of subjective evaluation and suggests implicitly that uncertainty remains beyond rational deliberation: too complex and altogether too dyadic to be subject to cognitive strategies that might meaningfully render this category more transparent or at least productively managed.

Knight's conceptualisation of uncertainty is, however, somewhat problematic. It constructs a kind of monolith that, by definition, renders it beyond science and rationality and thus beyond a politics of control or a science of management and mitigation. We perhaps need to inquire how uncertain uncertainty actually is. Knight has a graduated scale from highly probabilistic risks calculated through a priori probability analysis to a category that

he defines as beyond all forms of anticipation: events so unique, instances so exceptional, that they essentially fall outside our ability to comprehend them. This category, however, speaks to rare phenomena that many, if not most, of us never encounter. We live mostly in highly institutionalised environments mediated by rules, laws, and norms, all of which create path dependencies and a larger degree of certainty than uncertainty. And while, to be sure, the degree of social embeddedness of formal and informal institutional practices varies greatly between and within national communities, the cultural and social norms that arise from these contexts act to produce customs, practices and regularities which reduce uncertainties. In broader social contexts, then, to what extent is it valid to talk about the role of uncertainty dominating social life? Life patterns in industrialised countries and increasingly in large parts of Asia and Latin America, for example, display greater regularities than has historically been the case. Institutionalised statist approaches to the management of welfare, living conditions, healthcare provision and educational attainment, while not eradicating uncertainty, increasingly produce greater regularities and stability in our life patterns and the likely trajectories we will each experience.

Equally, if we consider the economic and business worlds to which Knight devotes much of his enterprise, these same predicates would seem to apply. The extension and normalisation of property rights and contract law, and the increasing degree to which investor rights are now subject to internationally uniform standards, surely introduce less and not more uncertainty. The emergence of the regulatory state and the codification of business law, market operation, securities law and the compliance requirements for reporting standards and corporate transparency obviously do not eradicate uncertainty in terms of business failure, corruption or poor management, but they increasingly regularise business operations and business practices which help reduce the prospects for happenstance.[34] Knight, of course, could not have anticipated the depth of the regulatory state or the great extension of institutionalised practices into the business and social world. The point, however, is that such practices perhaps change the categorical realm of uncertainty and reduce its visceral impact on the collective body politic. In other words, uncertainty might be increasingly less uncertain and the modes of analysis, institutional and regulatory practices that we bring to bear upon it might progressively subjugate uncertainty to processes that circumscribe its consequences. This is not a process of regulating uncertainty away, but an increasing ability to manage its consequences.

Furthermore, to what extent is uncertainty categorically unique such that it is impossible to map, anticipate or mitigate? There is, after all, a vast array of cognitive mapping strategies that exist in various disciplinary and professional settings aimed at helping manage uncertainty. Scenario analysis, for example, is hardly new, and is an integral part of agential reasoning and cognition. History is littered with such thought examples, from military strategists recounting the Peloponnesian wars and the scenarios played out by the Athenians against the Peloponnesian League, to the assault of Napoleon on Russia and the intricate scenarios of Marshal Kutuzov as he campaigned against the invading French. These same cognitive strategies were famously employed by business and the industrial barons of the nineteenth and twentieth centuries with great effect. Andrew Carnegie, John Pierpont Morgan, Henry Ford and John D. Rockefeller, among others,

were all masters at anticipating competitor behaviour and mapping their business moves in much the same way that a chess player would map out the alternative options of an opponent in order to presage their own moves and options. Whether formally mapped or cogitatively implicit, the point is that scenario analysis has proven a powerful tool in the management of uncertainty.

Similarly, the development and application of trend analysis techniques to social, political and economic phenomena, the use of path dependency analysis to map the trajectory of institutional forms, norms and practices of discrete segments of populations, or the use of Delphi techniques in the generation of political and commercial forecasts, have all emerged as key tools for managing situations of uncertainty. Indeed, converting uncertainty into manageable risks has been the hallmark of disaster and emergency planning. Hardening critical infrastructure, securing continuity of supply in the case of critical resources, redundancy back-up planning in the case of water supply, or emergency management protocols in the case of critical infrastructure failures, are all common preparedness protocols now widely adopted among professional agencies with proven ability to manage uncertainty and mitigate the impact of relatively infrequent events.

Uncertainty might thus not be the 'black hole' that Knight paints it, but a category where effective management protocols can be developed to reduce its effect and anticipate its consequences.

All of this does not repudiate Knight's risk–uncertainty schema, but it does make problematic his conceptualisation of uncertainty as a category which both dominates our lives and one which must forever remain enigmatic. It also raises questions about the ontological efficacy of conceiving of uncertainty as a realm of danger and/or harm. Knight was not alone in this. Despite their strong disagreements, Keynes shared his critic's pessimism, suggesting that in matters such as whether there will be war or whether stock prices would rise or fall, 'there is no scientific basis on which to form any calculable probability whatsoever. We simply do not know.'[35] In the absence of a rational, scientific calculation, uncertainty remained a dark and negative force. But is it? As Bernstein notes, 'uncertainty makes us free'.[36] Uncertainty liberates us from historical determinism – the grand designs of history as an ultimate trajectory manipulated by gods, men and megalomaniacs. Uncertainty democratises our collective destinies. The dark view of uncertainty as 'danger' or 'harm' perhaps, then, reflects a cultural anguish peculiar to techno-managerialists and the modernist project of constructing architectures of social and economic control rather than an objective assessment of the condition itself. The footsoldiers of science celebrate order, patterns and models able to relate cause to effect and inputs with outcomes. Uncertainty, by contrast, invokes notions of disorder, an absence of control and an inability to predict and manage. It is pre-science, pre-modern and primordial. As a man of science, Knight held contradictory views about the composition of uncertainty, seeing it as omnipresent and thus a 'black hole' beyond rationality, but also the quotient responsible for creativity, innovation and progress.

## *A risk discourse for social science and international relations?*

Knight's second great contribution lay in the risk research agenda he bequeathed to social science. Knight essentially pointed the way forward in terms of detailed, contextualised

historical studies of commercial processes and institutions and then tabulating the risk events associated with these to produce risk maps in terms of statistical probabilities. Knight essentially championed a method of analysis that would allow relatively high degrees of accuracy in anticipating risk events within discrete classes of instances. Experiential tabulation combined with the classification of instances rule, in other words, provides the one concrete social scientific tool that could garner insights not just into the frequency of risk events, but the contours of their severity, the nature of their impact and the resultant implications for the organisation/populations concerned.

Strangely, however, the uptake of Knight's approach has been sparse outside actuarial studies and certain facets of sociology, social work, medicine and public health. Part of the explanation for the poor uptake of similar approaches in political science and international relations (IR) undoubtedly lies in the propensity for rational choice methods and game theoretic approaches, which, ironically, preclude the kind of onerous data-gathering necessary to fruitfully develop classifications and statistical probabilities. Part of the problem also lies in the historical bias against 'grubby empiricism' – grand theoretical approaches and meta-narratives are much more fashionable and bring professional recognition. Correcting professional incentive structures is obviously no easy task. Yet if political science and IR are to make significant inroads into developing more robust risk assessment tools, and concomitantly to developing the types of interventionist risk mitigation strategies indicative of various health sciences and social work, some form of emulation might be necessary and desirable. As political scientists, for example, we tend not to map the phenomena we profess to study. Political risk analysis tends to be defined by ad hoc approaches relying on due diligence checklists, situation analyses or case study approaches. There is no data to mine, no longitudinal time-series data that might allow various classifications of risk (regulatory risk, contract repudiation, policy change, expropriation, etc.) to be correlated to institutional type or to specific institutional features such as accountability mechanisms, transparency, probity, institutional capacity, statutory independence and budget procurement practices.[37] This would yield significant insights into political risk, providing not only a means of calculating the propensity for risks in specific institutional settings but, more importantly, helping to define policy prescriptions that redress the institutional design flaws that allow risk generation in the first place. Knight's legacy might thus lie in emulating his method to develop and systemise a more rigorous theoretical basis for risk assessment in IR.

## *The limits of knowledge*

Knight's third and obvious contribution was perhaps his greatest: demarcating the possible from the improbable. In differentiating between risk and uncertainty, Knight explicitly suggested the limits of knowledge and the practical limitations of what can be controlled and or reasonably calculated. Knight was a rationalist and believed strongly in the role of rationality as a medium of scientific inquiry. But he was not a scientist, nor did he believe economics or any other social science could become a 'science' as might be true of physics or chemistry. Causality and the generative drivers of human action were simply too interdependent, too complex and far too emotive in terms of subjective calculation to make them amenable to general laws or principles.[38] Consequently, the role of the social scientist, in

Knight's view, could not be to 'discover truth', but to champion social justice and advocate ways for improving social outcomes.[39] Economics, in other words, was to be purposive.[40] As John McKinney notes, Knight's concern was to 'keep science within an appropriately restricted domain' while simultaneously using science 'to develop a rigorously mechanical interpretation of human conduct, and then as a social philosopher and moralist, impress upon his readers the "sweeping limitations" which must be placed on such an interpretation!'[41] Those limitations, of course, disposed Knight to place considerable analytical weight on the role that uncertainty plays in every facet of economic and social life, and to admit that this categorical realm spoke to the limits of knowledge, but at the same time should define its concerns, focus and energies. As Ross Emmett notes, the implications of Knight's *RUP* are profound: 'For the modern economist, bent on pursuing the science of economics to its limits, *RUP* presents a cognitive tragedy: in an open-ended universe, "the essential evil of uncertainty" is the impossibility of complete knowledge'.[42]

The ramifications of Knight's work thus remain as pertinent today as when it was first published in 1921. It is, perhaps, in this light that we should adopt Knight's contributions – exploiting his keen insights into the analytical distinction between risk and uncertainty, mining his methods as a means of developing more sophisticated tools for assessing risk through the calculation of statistical probabilities, but ultimately being informed by the limitations of what we can reasonably expect to achieve under the weight of uncertainty.

## Notes

1 Donald Rumsfeld, 'Department of Defense news briefing', 17 October 2001. Available at: www.defenselink.mil/transcripts/transcript.aspx?transcriptid=3793.
2 Frank H. Knight, *Risk, Uncertainty and Profit* (Washington, DC: Beard Books, 2002), pp. 199, 201 (*RUP*).
3 *RUP,* p. 201.
4 Frank Knight as quoted in Peter L. Bernstein, *Against the Gods: The Remarkable Story of Risk* (New York: John Wiley, 1998), p. 219.
5 *RUP*, p. 213.
6 *RUP*, pp. 213, 247.
7 *RUP*, pp. 121–3, 204–5. See also Kenneth J. Arrow, *Essays in the Theory of Risk Bearing* (Chicago: Markham Publishing Company, 1971).
8 *RUP*, p. 204.
9 *RUP*, pp. 212–13.
10 *RUP*, pp. 249–50.
11 *RUP*, pp. 246–7.
12 *RUP*, pp. 213–14.
13 *RUP*, p. 214.
14 *RUP*, his emphasis.
15 *RUP*, pp. 224–5.
16 *RUP*, pp. 224–5.
17 *RUP*.
18 *RUP*, p. 225.
19 *RUP*. See also Stephen F. LeRoy and Larry D. Singell, 'Knight on Risk and Uncertainty', *Journal of Political Economy*, 95(2), 1987, p. 397.
20 *RUP*, p. 217. See also James L. Athearn, 'What is Risk?', *Journal of Risk and Insurance*, 38(4), 1971, pp. 639–45.

21 *RUP*, p. 227.
22 Jochen Runde, 'Clarifying Frank Knight's Discussion of the Meaning of Risk and Uncertainty', *Cambridge Journal of Economics*, 22, 1998, p. 541.
23 *RUP*, p. 225.
24 See also C. Robert Taylor, 'The Role of Risk Versus the Role of Uncertainty in Economic Systems', *Agricultural Systems*, 75, 2003, pp. 251–64; Runde, 'Clarifying Frank Knight's Discussion', pp. 539–46; David Dequech, 'Uncertainty and Economic Sociology: A Preliminary Discussion', *American Journal of Economics and Sociology*, 62(3), 2003, pp. 509–32.
25 *RUP*, p. 226.
26 *RUP*.
27 *RUP*. See also the discussion in Tony Lawson, 'Probability and Uncertainty in Economic Analysis', *Journal of Post Keynesian Economics*, 11(1), 1988, pp. 38–65.
28 R. A. Gonce, 'F. H. Knight on Capitalism and Freedom', *Journal of Economic Issues*, 26(3), 1992, p. 829.
29 LeRoy and Singell, 'Knight on Risk', p. 397.
30 Frank Knight as quoted in Gonce, 'F. H. Knight on Capitalism', p. 829. See also Taylor, 'The Role of Risk', pp. 251–64.
31 A contrary interpretation to the one I have offered here concerning Knight's distinction between risk and uncertainty is provided by Richard M. Langlois and Metin M. Cosgel, 'Frank Knight on Risk, Uncertainty, and the Firm: A New Interpretation', *Economic Inquiry*, 31, 1993, pp. 456–65.
32 John Maynard Keynes, *The General Theory of Employment, Interest and Money* (London: Macmillan and Cambridge University Press for the Royal Economic Society, 1973), p. 148. See also Mark Perlman and Charles R. McCann, 'Varieties of Uncertainty', in Christian Schmidt (ed.), *Uncertainty in Economic Thought* (Aldershot: Edward Elgar, 1996), pp. 9–20. See also Oliver G. Wood, 'Evolution of the Concept of Risk', *Journal of Risk and Insurance*, 31(1), 1964, pp. 83–91.
33 These Knightian propositions were not unproblematic. See, for example, T. W. Hutchinson, 'The Significance and Basic Postulates of Economic Theory: A Reply to Professor Knight', *Journal of Political Economy*, 49(5), 1941, pp. 732–50.
34 See, for example, David Levi-Faur and Jacint Jordana, 'The Rise of Regulatory Capitalism: The Global Diffusion of a New Order', *Annals of the American Academy of Political and Social Sciences*, 598(1), 2005, pp. 200–17.
35 John Maynard Keynes as quoted in Pat O'Malley, *Risk, Uncertainty and Government* (Bodmin: Glasshouse Press, 2004), p. 4.
36 Peter Bernstein as quoted in O'Malley, *Risk*, p. 4.
37 See Paul Dragos Aligica, 'Institutional and Stakeholder Mapping: Frameworks for Policy Analysis and Institutional Change', *Public Organization Review*, 6, 2006, pp. 79–90; J. Roger Hollingsworth, 'Doing Institutional Analysis: Implications for the Study of Innovations', *Review of International Political Economy*, 7(4), 2000, pp. 595–644. Notable and fascinating contributions to empirical–institutional mapping exercises can be found in Thorsten Beck et al., 'New Tools and New Tests in Comparative Political Economy: The Databases of Political Institutions', Policy Research Working Paper No. 2283 (Washington, DC: Development Research Group, World Bank, 2000); and Yi Feng, 'Political Freedom, Political Instability and Policy Uncertainty: A Study of Political Institutions and Private Investment in Developing Countries', *International Studies Quarterly*, 45, 2001, pp. 271–94.
38 John Nash, *Cost, Uncertainty, and Welfare: Frank Knight's Theory of Imperfect Competition* (Aldershot: Ashgate, 1998), p. 59. See also Frank H. Knight, *Intelligence and Democratic Action* (Cambridge, MA: Harvard University Press, 1960); Frank H. Knight, *Freedom and Reform: Essays in Economics and Social Philosophy* (New York: Harper and Brothers, 1947).

39 Arthur Schweitzer, 'Frank Knight's Social Economics', in Mark Blaug (ed.), *Pioneers in Economics: Frank Knight (1885–1972), Henry Simons (1899–1976), Joseph Schumpeter (1883–1950)* (Aldershot: Edward Elgar, 1992), p. 35.

40 Indeed, Mary S. Morgan suggests that Knight's thinking was so antithetical to notions of economic science and specifically to economistic abstractions like 'economic man' that 'Knight insisted that this ideal figure of economic science does not help describe actual economic behavior, and so cannot be used for socially useful economic analysis or policy interventions'. See Mary S. Morgan, 'Economic Man as a Model Man: Ideal Types, Idealization and Caricatures', *Journal of the History of Economic Thought*, 28(1), 2006, p. 15.

41 John McKinney, 'Frank H. Knight on Uncertainty and Rational Action', *Southern Economic Journal,*43(4), 1977, pp. 1439–40.

42 Ross Emmett, 'The Economist and the Entrepreneur: Modernist Impulses in Frank H. Knight's *Risk, Uncertainty, and Profit', History of Political Economy* 31 (Spring), 1999, p. 31.

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