

Management's Role in the Theory of the Managed Firm (TMF)

J.-C. Spender

ESADE, Ramon Llull University, Spain

Abstract

Frank Knight intuited a link between uncertainty and profit. Unfortunately none of today's handful of theories of the firm grasps Knightian uncertainty well enough to say much about how managers might pursue profit rather than equilibrium. Melding Knight's work with Coase's questions and intuitions about the nature of the firm shows that coupling managerial judgment to uncertainty builds a bridge towards the TMF, a theory of the firm in which managerial judgment is crucial to both the creation of the firm and to its ongoing management. Entrepreneurship, strategizing, and leadership of others' judgment are drawn together into a profit seeking practice. Since it is not framed in a positivist epistemology the TMF is not a theory in the positivist sense. Rather it guides the practice of those whose judgments help resolve the entrepreneur's chosen uncertainties – and thereby create the possibility of profit. The TMF's re-framing of Coase's questions makes them answerable, hence it has much to say about business education and developing managers' judgment.

Keywords: *Knightian uncertainty, managerial judgment, theory of the managed firm, subjective economics*

INTRODUCTION

One of the curious consequences of our discipline's insistence on rigorously theorizing choice in firms and markets is that we risk excising managers and their demarcating contribution. Is the manager we idealize no more than an appropriately programmed digital computer - without beliefs, ethics, or humanity? No question, beliefs and ethics matter when real managers make decisions; but how can this be included? On the one hand managerial decision-making is the problematic of the tradition shaped, especially, by the post-WW2 work at RAND, Chicago, and Carnegie Mellon (Buchanan & O'Connell, 2006). On the other, managers' decisions drive the business history narrative as firms come and go; but are historical methods rigorous enough to generate findings rather than stories? In

general management decision research is framed in at least four different ways; (a) rigorously abstracted in mathematics and game theory (Camerer & Weber, 1992; Raiffa, 1968; von Neumann & Morgenstern, 1944), (b) following Robbins's definition of economics as maximizing within opportunity costs (Backhouse & Medema, 2009; Robbins, 1952), constrained resource allocation, (c) recognizing the human decision-maker's 'bounded' cognitive limitations, with empirically grounded behavioral and psychological theories (e.g. Dane & Pratt, 2007; Sterman, 1989; Tannenbaum, 1949; Tannenbaum, 1950) or (d) by locating the boundedly rational decision-maker in a contested socio-political situation (Cyert & March, 1963; Edwards, 1979).

The first pair of framings, (a) and (b), differ from the last in several ways, most particularly be-

cause a different axiomatic 'model of the choosing individual' is used - rational in the first pair, 'bounded rationality' in the last pair. Though bounded rationality remains something of a puzzle (Spender, 2013) the term 'curious' is more properly applied to programs (a) and (b), for the assumption that we are perfectly rational does little more than construct an intellectual game that has no obvious power to explain human behavior or real world economics and, thus, no real utility for explaining managing. This also frames both firms and markets as implicitly rational and explainable, and maybe once we presume the firm explainable there is little left to explain beyond repeating our assumptions. No question, most of our discipline's researchers regard firms as unproblematic entities that can be labeled, counted, measured, and collected in large samples without regard to their specifics. They are presumed generic, items in a category of well-defined economic entities, just as markets are presumed generic, efficient, and captured with Marshall's 'scissors' without reference to the goods or services traded.

Impelled by our sensing important differences between managing and computation, there is some pushback against the assumption that firms are essentially alike, as human beings might seem alike to medical students who know no better, and to separate, for instance, SMEs from global concerns or family firms. The criteria are mechanical, number of employees, turnover, market capitalization, and so on, and pay no attention to the firms' managers or what they do and how they might differ. To the contrary, within these categories managers do more or less the same thing - make resource allocation decisions as rationally as possible. Yes, there are interesting differences between firms' performance in different industries, as measured by ROI, competitiveness, and concentration, suggesting industries differ in some fundamental ways and, by implication, that firms might differ too (Grant, 2007). Even here the manager as a specific individual, and her/his specific non-computational contribution, gets lost in inter-industry statistics about the firm's performance. It may follow that only when researchers look at entrepreneurs can the specificities of managing be properly explored - though the entrepreneurial task of creating a firm is often sepa-

rated from the managerial task of running it. Here again the academic journals' methodological dispositions overpower attention to specifics, pushing researchers to sample and search for 'causes' of entrepreneurial talent and the entrepreneur's modelable processes (Busenitz et al., 2003).

All of which helps show how research methods that put managers into categories that identify their commonalities and deny their uniqueness make it difficult if not impossible to uncover how they are unique and in consequence, what they really do other than compute rational decisions. Put differently, the nature of the managerial contribution is being determined by the researcher's assumptions about the nature of the firm to which they contribute. The firm is defining; managing is supplementary. The managers' decision-making is rational because we presume the firm to be a rational apparatus for transforming inputs into outputs in the pursuit of profit or whatever organizational goal has been chosen. Managers are defined as the rational firm's resource allocation instruments, and since the firm is presumed rational so managers' choices must be rational too - even as the choice of 'strategy', of organizational goal, cannot be fitted into this framing. The choice of goal - such as profit - is typically glossed as 'obvious', scarce worthy of comment (Simon, 1964). The manager as strategist is presumed to inspect the world, evaluate knowable opportunities, and rationally choose the most optimal or 'satisfice'. How can this be done in the absence of full rationality? Total knowledge of the world is presumed, not only its present state but also those future states that are today's opportunities - yet who in 1984 knew to invest everything in Apple Inc.? If bounded rationality is admitted it is double-acting; the uncertainty of the individual making the firm's market engagement and resource allocation decisions meshed with the uncertainty of the strategist/entrepreneur's knowledge of the world. It is not possible to say whether bounded-ness is a feature of the world or of the individual, for it is about knowing their interaction.

The research strategy of presuming the firm unproblematic, the manager fully rational, and the world fully discoverable is 'curious' - at best. It provokes two research questions commonly silenced by our discipline, though there are rumblings

of discontent about what we do and what we claim to know as a result (Hambrick, 1994). The first is about why we chose such a 'curious' research strategy and allowed it to dominate our institutional processes - for it shapes admission into the academic profession, publication, tenure, and promotion. Many complain about the degree to which quantitative methods dominate. Yet the complaint is surely misplaced, for there are ever more data being collected that can be digested and whose strategic implications can be brought into real firms' processes (Spender, 2012). Students must be equipped to deal with the analytics that are here to stay; ignoring them will surely lead to strategic disadvantage (Davenport, 2006). Complaints about quantitative methods do nothing to answer the question "How did we get here?" even as it seems especially urgent to address this as the rigor-relevance issues loom larger. Note how our discipline shows little interest in historical analyses, neither of firms nor of our own discipline and its progress. Yet most realize that without a sense of history there can be no insight into the nature of our present. The second question, of course, is about the nature of the firm as an entity that connects or intervenes between the strategist/entrepreneur and the world, market, or economic environment in which the firm is embedded. In 1937 in *The Nature of the Firm* (NOF) Coase asked this in the form of four sub-questions: Why do firms exist? Why are their boundaries located where they are? Why are their internal arrangements as they are? Why is their performance so varied? (Coase, 1991). If we were able to answer these questions with a relevant 'theory of the firm' we would have a pretty good idea what real managers do and how they differ from computers. But we cannot. Then the problem is that without a tenable theory of the firm (ToF) we lack a relevant (empirical) notion of managing. Plus, absent this theory, we have no basis on which to separate the activities of managers, strategists, or entrepreneurs - or, indeed, of employees or any of the firm's other stakeholders. Nor do we have a viable basis for teaching management.

After WW2 Coase's questions induced a small group of micro economists to search for answers. Today we have a variety: transactions cost economics (TCA), principal-agent theory (PAT), nexus of

contracts, property-rights, team production, and so on. Each implies a different notion of managing. TCE deals first with the make or buy decision at the level of the firm as a contracting actor and then considers (a) the 'fundamental transformation' as non-reversible contractual commitments are made and (b) having to contain the opportunism and bounded rationality of the individuals who comprise the firm. In PAT the manager has to determine an appropriate mix of monitoring, incentives, and losses (Spender, 2011). In both TCE and PAT the managers' choices reflect the firm's specifics; in TCE comparative costs, in PAT comparative losses. The other ToFs imply similar choices are dependent on the firm's legal circumstances, for instance to use the assignment of property rights to align interests. At first sight all these 'new ToF' answers to Coase's questions rely on 'rational man' thinking, or at least satisficing or 'best effort' reasoning. In this respect they fail to address Coase's first question about firms' existence, for if we and the markets arising out of our interactions with others are fully rational or even satisficing there is no anticipate-able profit to be earned because such markets 'clear' instantly, profits get competed away. In which event such markets are all we need to bring the factors of production together optimally and transform them predictably into outputs. This is appreciated to the extent that many presume firms exist only because of 'market failure'. This tells us little, of course, for without a theory of market failure, denied if markets are assumed perfect, so we cannot generate a ToF or of managing. In spite of the post-WW2 Nobel Prizes garnered micro economics is still without a tenable ToF - and we are without a tenable theory of managing beyond pure computation. Some presume Coase answered his first question as he replaced the friction-less world of neoclassical micro economics with the world of transactions cost; yet this was not his own view (Medema, 1995:11). Positing transactions costs certainly led on to new theorizing; but no empirically viable ToF and of managing resulted because, of course, the costs of real transactions cannot ever be fully determined; as any accountant knows, marginal costs are one thing, overheads quite another. Thus a transaction cost minimizing ToF presumes, once again, perfect knowledge; likewise rigorous solu-

tions to PAT relationships. In summary, we see the present handful of micro economic ToFs are no more than suggestions about lines of thought that might lead towards viable theory and answers to Coase's questions.

Organization theorists have long had their own handful of ToFs, nicely summarized in Morgan (Morgan, 1997). Chief among them is bureaucratic theory, and variants of it are what most of our discipline's researchers mean by firms. Firms are 'things' that have structure, with systems of accountability and authority drawing the division of labor and resulting work roles into a coherent whole. In this frame managing means designing and controlling, and with resourcing, has been elaborated into POSDCORB, the acronym for management practice that has withstood the test of time and over 50 years of disciplinary research. Converging on such notions are the legal and accounting conceptions of the firm - its charter, legal bounds, and obligations or its balance sheet. Managing all these is presumed essentially rational. But even if we know something about setting the firm's boundaries and internal arrangement we have no answer to Coase's first question, plus bureaucratic theory puts the strategic choice of organizational goal outside the analysis. All bureaucratic thinking presumes there is a reason or explanation for the firm's existence. At this point many retreat and suggest Coase's first question can be answered by asserting that firms exist 'to supply society's needs' or 'to create jobs and taxes' or 'to provide investors with opportunities' and so on. Even if these answers were non-tautological they would say little about the process of choosing goals or of managing. Given the intractable and unproductive character of the discussion above can it be turned into a more productive direction?

UNCERTAINTY AND JUDGMENT

In the sections that follow I redirect the discussion by presuming our world is uncertain and that its uncertainties can only be engaged and dealt with 'mindfully' - as opposed to blindly or randomly - by admitting manager's judging as a complement to their powers of rationalization. Put differently, managers reason as best they can, given their bounded rationality, but such analysis can never

fully determine their choices and practices and thus those of their firms. An uncertain world mandates judgment if action is to be mindful. Managers certainly provide their firms with some of the computational resources required - whether some choices are driven by market and pricing data, some about designing the firm's structure and administrative system, designing its personnel monitoring and incentive systems, making or buying, negotiating and signing contracts for funds, resources, or deliveries, hiring or firing, promoting, and so on. But in real business such computation must always be complemented by acts of managerial judgment. These judgments might equally be labeled entrepreneurial or strategic if that illuminated their nature, and it might for those who see little distinction between judging and analyzing. The justification for this line of argument is well known, Knight's PhD thesis, revised and published in 1921 as *Risk, Uncertainty, and Profit (RUP)* (Knight, 1921). But *RUP* seems curiously without follow-up, development, or elaboration, so we need to go some distance beyond citation to find a way of theorizing managing under Knightian uncertainty. The literature here includes Williamson's use of 'uncertainty', yet is far from conclusive. We see Knightian uncertainty is more often deployed to disrupt purely rational discussion than to point towards a viable theory or model of managing - this paper's objective.

Three stepping-stones open up discussion of managerial judgment as a response to Knightian uncertainty - the works of Locke, Knight, and Coase. Knight's argument in *RUP* appeals, with only one passing citation, to the widely accepted notion of judgment that was drawn into the Anglo-Saxon literature by John Locke in his *Essay Concerning Human Understanding*. Aside from being hugely influential as America's founding political philosophy there is a considerable literature on what Locke meant and whether his arguments hold, recently re-energized by the work of Etienne Balibar (Balibar, 2013). Without getting into the minutiae, we see one of Locke's main proposals is that human beings have more than the sole capability to reason rationally that urged Descartes towards *cogito ergo sum* as the only mode of knowing that could be sustained in the face of radical doubt about

our sense data (Sandford, 2013). The move from Descartes's position, based on rationality alone, to a Lockean one that presumed both rationality and judgment, opened up an entirely different discourse of immense disciplinary significance. Note it is not a matter of 'proving' rationality-based Cartesian approaches 'wrong'; it is simply a different mode of analysis. But the added value of the Lockean discourse is to help us explore real world economic phenomena that cannot be grasped by the rationalist conversation, drawing them into a different analysis.

At the same time the switch of discourse may come at a considerable methodological loss. Specifically, good science hinges on creating domains of rational discourse, so discussions of managerial judgment, defined as standing outside rationality and in an alternative discourse, might seem inherently 'unscientific', where 'anything goes' (Feyerabend, 1993). Here we find a division of academic purpose between generating rigorous theory that contributes to our discipline's body of rigorous scientific knowledge versus the different objective of helping managers achieve greater clarity when thinking about their actions in an uncertain Knightian world. As the rigor-relevance debate shows, not all scholars are interested in the second, though one might reasonably expect to find many in business schools who are.

Clearly it is not possible to define judgment scientifically or 'objectively'; it is an allusion or rhetorical term used to convey our sense of acting thoughtfully and confidently as we put ourselves into an uncertain world. Judgment is a manifestation of our undeniable or residual subjectivity, our awareness of ourselves as manifest in our actions' intentions - as in 'we are what we do under uncertainty'. Locke illuminated his notion of judgment along these lines when he wrote: "the faculty which God has given Man to supply the want of clear and certain knowledge in cases where it cannot be had, is judgment ... the mind sometimes exercises this out of necessity, where demonstrative proofs and certain knowledge are not to be had, and sometimes out of laziness, unskillfulness, or haste, even when demonstrative proofs are to be had" (in Spender, 1989:45). Of course, this is a 'negative' definition

that hinges on the absence of something that can be defined, in this case fully rational action, or, more specifically, rationally chosen action in a completely known context. Rationality is defined by an appeal to something beyond us, logic. There is no doubt of our ability to think logically, we often do. At issue is whether we have any other modes of thought, defining what it is to be human. Judging is an aspect of being human precisely because behind judging lies acts of imagination, which lies beyond the possibility of being defined because it lies within us, in the private realm that is not open or available to others. We would have to know ourselves completely if judgment was to be defined. *Ex definitio* machines do not have imagination precisely because there is nothing about a machine that is not already known by its designers and constructors. Hence what we mean by imagination is an aspect of our lack of self-knowledge coupled with our experience of a mode of thinking that cannot be explained. Thus there is little to be said about our imagination beyond our own experience of it. We define imagination as we define ourselves to be human, making it a human trait we associate with our experience of our own vitality and consciousness. It cannot be fitted into the causal relationships on which our notions of explanation depend.

Likewise assertions that some have more imagination than others, or that the imagination can be spurred by, say, LSD, are inherently tautological, indications of dogmatic positions that are not open to discussion or falsification. Judgment differs from imagination because it points to the collision between what we might imagine and what we can bring about in our world. Our imagination is unconstrained - as far as we know, though some neurological boundaries might well follow from the brain's physicality as some think bounded rationality is the product of our neurology. Locke argued our understanding is framed in ideas arising from two sources, self-reflection and sense data from the world beyond the mind. Thus against the imagination's unbounded-ness, we know good judgment is constrained by the circumstances of our action, leading to knowing that is appropriate to the situation, what the Greeks called '*phronesis*' (Flyvbjerg, Landman, & Schram, 2012; Nonaka & Toyama, 2007). Thus an act of judgment is an act of human

agency, presuming that human action is not fully determined and that there are *phronetic* agentic choices to be made. One result of Locke's thinking is that in a person-respecting democratic society we are held more accountable for our judgment and choices than for our actions, the principle that underlies the defense plea of insanity, the failure of our God-given judgment that drives the law to look behind the action to the intention.

KNIGHT AND COASE

With *RUP* Knight made a huge impact on economics by arguing that the possibility of economic value-creation or true profit (as opposed to accounting profit) arose precisely and only from the business situation's uncertainty - the incompleteness of our anticipations of the results of action. In spite of these uncertainties, entrepreneurs take considered action in the real world, and thereby resolve the uncertainties they confront - in Yogi Berra's words, they arrive at fork in the road and take it. Practice 'resolves' uncertainty by 'pushing through'. To the degree the outcome could not be anticipated it is both surprising and possibly profitable - you cast your bread on the waters and it comes back as ham sandwiches. By acting in the face of existential uncertainty entrepreneurs and their firms differ in ways revealed by their judgment and the profits accrued, an economic metric. Likewise people differ in the lives they experience, suffer, and create; a different metric for their different judgments. There is a long bridge between discovering or actively selecting some of the world's uncertainties and generating the profits entrepreneurs might garner by engaging them.

Knight did not offer a ToF for this bridge's design or construction; he simply put a fundamental question before his colleagues - "whence added economic value?" While Coase did not offer a ToF either his comments are pertinent and point in promising directions. It is useful to know Coase knew little of Knight's work as he sat in on a few of Knight's lectures at Chicago in 1932 (Williamson & Winter, 1991:44). As is clear from his lengthy comments in *NOF* he was not mightily impressed (Williamson & Winter, 1991:23). He read *RUP* in Dundee in 1933 (Williamson & Winter, 1991:49) largely because 'everyone at LSE was talking about

it' (Coase, 1993:239). Yet it did not change the ideas that went into *NOF* (Williamson & Winter, 1991:49) for Coase felt Knight failed to demarcate firms from markets (Williamson & Winter, 1991:27) and thereby imply a ToF - Coase's intellectual target. Coase was more influenced by Batt's *Law of Master and Servant* (Williamson & Winter, 1991:56) which suggested a ToF could stand on the 'supersession of the price mechanism'. As an economist he presumed prices coordinate markets and so neglected the human issues that animated Austrian economics (Shand, 1984). Rather he thought of master-servant subordination as the firm's alternative and defining mode of administration (Williamson & Winter, 1991:29). The firm is defined neither as a production function nor as a bundle of resources but by its mode of administration. Weber is in the background and at first sight Coase's approach seems consistent with bureaucratic theory; but with a notable difference. In Weber's formulation the bureaucratic mode of administration is grounded in rationality, scientific knowledge of the goal and the division of labor and its control. Authority is power legitimated, implying closed contracts of employment. Coase's allusion is to very different kind of power that produces voluntary subordination to management's will, to an incomplete contract shaped the individual's judgment, limited by labor law as a social institution, rather than by the employee calculating the benefits.

Though Knight and Coase were both economists, they were not engaged in the same intellectual project - they seemed to talk past each other. Perhaps Knight focused on the entrepreneurial aspect, how uncertainty-resolving judgment and practice would be the precursor to profit, and on the implications for economic theorizing. Coase, in contrast, pondered the nature of the firm. The entrepreneurship literature knows this as the distinction between the types of market failure fundamental to Richard Cantillon's thinking, for whom entrepreneurship is arbitrage, the successful entrepreneur being the person who can spot and take advantage of profitable arbitrage opportunities, and Jean-Baptiste Say, for whom the entrepreneur is the person who creates and manages a firm as the chosen way to exploit an opportunity. Like Say, Coase was less interested than Knight in what we now call

the 'entrepreneurial idea' - and the exercise of judgment.

Knight and Coase differed in other ways that bear on this discussion of managing. Knight was deeply religious and this influenced his concept of economics (Emmett, 2009). Coase's religious beliefs are obscure, but he was probably more of a social-liberal who believed better economic thinking could help improve the democratic process and society at large. While Knight's work is notoriously complex, Coase's is more straightforward provided one appreciates his interest in how law and legal institutions shape the terrain of democratic capitalism's economic activity (Coase, 1992; Medema, 1995:1). Coase sustained a life-long battle against the rise of positivist formalism in economics, arguing it excised the most important realities of economic life. His project, especially obvious in his 'social cost' paper, was to urge economics towards greater realism by introducing the kinds of social and legal specifics and difficulties that formal economics wrote out of the analysis. His critiques of the resulting 'blackboard economics' were withering. He worked in the tradition of British empiricism at the interface of law and economics and on developing workable insights through observation of real economic activity, data analysis, and induction; hence he took particular exception to claiming that predictive power was the proper test of economic theory (Medema, 1995:4). Notwithstanding he regarded economics as potentially salvageable; it simply needed to be developed towards greater realism. Firms existed, posing a puzzle about the real, not susceptible to being axiomatized as another category of rational actor.

Knight's views were more complex and difficult to pin down. In the face of the 'colonizing' advance of positivist thought and method (Fine & Green, 2000), Knight's engagement with uncertainty, *non-pareil* in economics, though Simon and Shackle deserve mention, was radical in the extreme sense of the term; indeed he labeled himself a 'radical empiricist' (Knight, 1921:201n; Shackle, 1979). At the same time he managed to occupy a remarkable intellectual position, bounded on one side by his great commitment to theoretical economics and, on the other, his religious intuition that its relevance to contemporary society was limited at best.

Making sense of Knight's work revolves around this tension (Emmett, 2009). Stigler looked for convergence and suggested Knight was not simply trying to change economics; rather his project was to re-ground the social sciences on more humane values, particularly religious (Stigler 1987). Emmett was more nuanced, seeing the tension as lasting throughout Knight's life, its creative impulse and its anchor.

The two economists' differences are profound in other ways. Coase was positivist in the sense he presumed Man can have some useful knowledge of an external socio-economic reality, and that the point of doing science (which would include economics) was to increase our control over that reality and thus our condition. Knight differing views can be illuminated by reference to the work of Giambattista Vico, whose views lie behind those Western thinkers who see a fundamental distinction between the natural and social sciences (Berlin, 2000). Vico argued Man cannot ever have true knowledge of Nature, because it is God's gift and construction and it is not given to us to 'enter God's mind' and see Nature as it 'really is'. But Vico was also a historian of language and law and argued that because Man made both as social artifacts, we can know them more profoundly. Knight likewise saw economics as a social artifact, a reflection of the way society works when property and scarcity shape how we live, not a science of universal laws. He believed formal economics invoked a Godless world in which rationality ruled, wherein economic actors required no 'moral compass' (Locke & Spender, 2011). Moving in the opposite direction he sought a God-filled society in which rationality was complemented or even superseded by other human values, made manifest through human judgment in action. This was a fork in the road whereat Knight could have pushed his religious concerns to one side and devoted himself to formal economics 'as if' it mattered; and in this role he became a prime mover to the Chicago rationalist tradition, especially as articulated by Friedman. Or he could have attacked formal economics for excising all values beyond gain through adopting marginalism. He wrote a great deal from the second position and his critique of formalism remains the most fundamental yet made, one that has not been

answered. (Note that behavioral economics does not do this.) But overall it seems Knight did not fully commit to either fork, which leaves us with the puzzle of his work and its ultimate objective.

Notwithstanding this ambiguity, Knight definitely opened up a new discussion with his intuition of a relationship between the empirical uncertainty of the real economy and profit, a discussion in which we might construct entirely different answers to Coase's questions about why firms exist and, by extension, what managers do. In spite of pursuing answers to Coase's questions, the 'new theorists of the firm' such as Williamson, Grossman, Hart, Tirole, Alchian, Demsetz, Klein, Aoki, Gustafson, Masten, Foss, and their many colleagues, still set out by making rationality axiomatic at the core of their methodology (Demsetz, 1988). Knightian uncertainty, if considered at all, as in Williamson, is neither resolved nor made central. In contrast I adopt a very different method and do not proceed from axioms asserted as certainties, such as rationality provides for formal economics, but from their absence - indicated by my appeals to imagination and judgment. This implies a problematic model of the individual and of the nature and consequences of her/his interactions with others. From a methodological point of view this leads a different kind of analysis, empirical, bounded, and situational, that does not involve deduction and test, but points towards induction and the attempt to clarify human action and practice from experience.

THE FIRM AS A LANGUAGE

Whereas Knight had little to say about firms *per se*, Coase had much. There are many ways of interpreting his thoughts, but if we fasten on the notions of 'super-cession' and 'subordination' it is possible to see the firm as an island ordered by non-economic discourse yet set within a sea of price-organized market activities. Note in *NOF* Coase uses Robertson's metaphor of 'islands of conscious power' (Williamson & Winter, 1991:19). Simon likewise used an island metaphor (Simon, 1991). Thompson, following Barnard, implied similar with his analysis of core and boundary-spanning (Thompson, 1967). As an economist viewing the firm and its management from afar, Coase pointed to the foreignness of the island, but did not suggest

how it was organized beyond suspecting it was done through master-servant relationships and, by implication, the presence of power - to be contrasted against the absence of power in approximately perfect markets (once law and social institutions are taken into account). The question posed was how the island might be organized in the absence of the prices necessary to determine rational administrative choices. Incidentally Coase also noted the possibility of markets on (within) the island. But the island's demarcating character was otherwise. Again it is useful to recall Williamson's PhD was about the firm's internal market for management performance and did not suggest a new ToF (Williamson, 1964).

Knowing other modes of coordination cultural anthropologists, or institutional or political theorists might view the firm as an island demarcated by its non-economic coordinating language, positing a domain distinguished from the market domains coordinated by economic language. Being another negative definition, it gets us no further if we cannot specify the non-economic language or at least something of its character. Though note how, looking past structure and design, bureaucratic theory implies the firm as the set of standard operating procedures that specify its rational language. Its downside being that certainty and full knowledge is presumed and 'the facts' drive - whereas the language we seek has to be able to identify the Knightian uncertainties to be engaged in the pursuit of profit. As this language is identified theorizing the emerging ToF becomes the work of an applied linguist or language philosopher. Fortunately language is not new intellectual territory, as the earlier reference to Vico reminds; to the contrary, it is an ancient field, packed and contested (Weisler & Milekic, 1999). Formal language models its objects of attention in ways that are fully determining of their behavior, most obviously as mathematical formulae, formal language that points to a domain of abstract logical reasoning. Many presume that science's objective is to bring all our real world experience into such a domain. In contrast I presume it is to improve our capacity to act mindfully under uncertainty.

We know science's grasp of everyday life is limited. A great deal else goes on that warrants being

spoken about. For instance, emotions, values, and beliefs; more important in the economic realm are doubts and uncertainties. An epistemology capable of addressing uncertainties differs from that of mathematics, which is rigorous precisely because it allows only two kinds of statement - true and false. A truth here is analytic, contingent on the axioms adopted that are defined as true. All true statements can be derived logically and rigorously from the axioms adopted. Discovering such statements, as mathematicians do, may lead to surprises but there is a sense in which once the discourse's axioms have been chosen one can say little more within that language. Empirical science presumes a different form of truth, practical examination of hypotheses, and so demands an epistemology that reaches beyond analytic truths that are not open to falsification towards predictions that are - presupposing a non-analytic language of experience or observation that then complements the language of the hypothesis. In an experiment the analytic language of deduction, hypothesizing, is collided with the non-analytic language of observation and induction, empirical results - just as the LHC's proton beam smacks into the target.

The collision is informative. Many take understanding an experiment's result as relatively unproblematic and believe that the process can say something definitive to hypothesis, that there is no uncertainty. Unfortunately we know this is logically incorrect even if this realization is generally ignored; the specifics being part of the Duhem-Quine conjecture that the collision cannot be conclusive (Sawyer, Beed, & Sankey, 1997). The discussion helps shows empirical science's 'findings' are always matters of institutionalized disciplinary judgment rather than of logic, and so often dominated by the disciplinary conventions packed into the discipline's 'paradigms'. Being matters of judgment rather than logic, these are inherently unstable, as Kuhn pointed out. The point is that even the language of empirical science is immiscible with the language neoclassical economists presume appropriate to 'explaining' economic phenomena. Being profounder thinkers both Knight and Coase knew that economics is either an analytic science, a formalized mathematical game beyond refutation; or it is an empirical science of real world activity

whose discourse stands on disciplinary judgments. If it is to be useful to managers, and to lead towards the TMF, the firm as a language must move towards the second and be open to addressing the Knightian uncertainties from which profit and economic growth can spring. A formal or logically constructed language cannot grasp or express Knightian uncertainty. Most who use the term uncertainty do so from within analytic language and mean something very different, specifically the absence of certainty when presented with probabilistic data indicating the variety of possible alternative states a particular variable might take up. Knight, of course, used the term 'risk' to point toward such data, the practical consequence of not knowing the variable's particular state. The meaning of Knightian uncertainty is fundamentally negative in analytic language, little more than the inability to model some phenomena, even probabilistically. A different 'natural' language is required if we are to make something positive of Knightian uncertainty.

Everyday talk is not 'formal', structured analytically; it is 'natural'. We speak natural language. It is riddled with ambiguities, contradictions, and non-sequiturs, but these and other analytic failings are the means whereby we can grasp and communicate our uncertainties. Unlike formal language in which every true statement that can be said is implicitly already said as the axioms are chosen, the openness of natural language means that surprising new things can be said. This is possible because natural language takes the uncertainties of our circumstances for granted, along with the irrelevance of certainty to conducting ourselves purposively therein. Thus the meaning and import of natural talk is always 'up for grabs' for nothing expressible in everyday language can carry the weight necessary for 'proof'. Rhetoricians exploring the persuasive use of natural language use the term '*pisteis*' - compelling argumentation as opposed to logical proof - *pisteis* lives on as 'beyond reasonable doubt'. In natural language's context, *pisteis*, the product of persuasion, leads to mindful action because judgment is involved. If the situation were known completely its 'facts' would determine 'right action', no judgment would be called for. In our uncertain world our actions manifest our judgment. A leader's rhetoric shapes others' actions by shaping their

judgment, so generating collaborative purposive practice under uncertainty. Rhetorical activity requires a language that embraces purpose, context, and action (Spender, 2014). So the firm as language must indicate the uncertainties the entrepreneurial idea engages and the actions necessary to resolve them and thereby bring the firm to life. It must persuade those whose practices engage both the certainties of the world (as in bureaucratic theory) and its associated Knightian uncertainties (excised in bureaucratic theory).

One way to illustrate the distinction between formal and natural language is to point to the separate discourses Knight held in tension - the world of abstract formal economic discourse and the real world value-penetrated discourse about our embedded socio-economic, political, and religious practice. Many, like Stigler, and the scientists who ignore the fundamental epistemological discontinuities surfaced in the Duhem-Quine discussion, presume the language of experiment is an approximation to and can eventually be distilled into the formal analytic language of scientific theory, that Knight's two universes can be merged into universal laws and logical certainties. This is a serious epistemological mistake, though widely made and seldom remarked. In the process the language of experimental science must lose its natural-ness, its capacity to indicate uncertainty and capture newness, or in Kuhn's analysis, to express the 'anomalies' that drive paradigm change. Natural language's fundamental ability is to indicate Knightian uncertainty and grasp the surprises resulting from our practices as we resolve the uncertainties we engage. The language's unbreakable attachment to practice is crucial because spoken language cannot indicate uncertainty, for it is an absence. But the practice of resolving uncertainty can be known as an effective practice - the notion behind 'tacit knowledge'. As Polanyi explained, the skilled bike-rider can demonstrate how to resolve the uncertainty about bike-riding that cannot be resolved by using language; alternatively showing that no explanation of the practice is ever sufficient to the practice. There is an unbridgeable gap between saying and doing that would, of course, disappear in a certain world. Thus those of a positivist inclination think of practice as an enactment of theorizing. In contrast, it goes the

other way around, from practice to language and thinking. As a result, as Wittgenstein and Searle suggested, natural language's meaning is always associated with and tied into our notions and experience of practice. In which case language may be analyzed by considering what it does for us in our lived world. Somewhat similarly Peirce focused on the consequences of its use.

Natural language's openness admits the possibility of uniqueness precisely because the discourse cannot exclude contradictories, non-sequiturs, and other sense-absences - or complete nonsenses. One way to think about this is to presume natural language is pluralistic, comprising a vast bundle of partly formalized discourses. Natural speech bridges, combines, and synthesizes these, sometimes conveying something that cannot be conveyed in any one discourse, sometimes creating nonsense. We can talk about trains running and being at a particular place ruled by Newtonian mechanics, and be formal. We can talk quantitatively about what is on board the train. But in the real world we might also talk about the countryside the train is passing through, so making for several discontinuous discussions. We might relate them all in a story or a poem that captures our experiences, emotions, desires and fears. Narrative theorists explain how stories differ from proofs; they are creative syntheses of what the narrator knows that audience knows already, possibilities not logically excluded. There are no stories in mathematical language even though there are many fine stories about mathematics - Abbott's Flatland being a classic example (Abbott, 1884). There is no point in telling a story that hinges on things the audience does not understand. Most stories are designed to draw what is known into new contexts and surprising understandings. The stories in novels use shared language to convey new syntheses for the reader to experience, particularly richly in *Harry Potter* or *Narnia*. Thus the firm is not simply a language, it is a story synthesized by the entrepreneurial person implied by Cantillon plus Say. Rhetoricians know the story has to be situated to the audience's specific time and place. Peirce called this 'indexical', unique by definition, only understandable through knowing the context in the way people say "You had to be there to understand what

I am telling you". The content of the firm-as-story is grounded on what the audience knows already about the context of the firm's indexical situation. This why business people argue, correctly, that their situation is fundamentally unique and cannot be captured under general categories.

At this point the suggestion is that the firm is comprised of a plurality of natural languages that carry with it both the uncertainties chosen and the attachments to the practices that resolve them - implying a theory of language, of course. But this theory cannot be fully spelt out in the absence of a totalizing theory of all possible languages - of all human communication. So the analysis has to shift from the abstract concept of natural language to the specific real world content that enables one to distinguish one language - the vehicle for the things said - from another. Likewise we can look at different firms differing languages and analyze how one firm differs from another. Travel agent talk is not the same as grocer talk or that of the mobile 'phone makers. So I set out presuming firms are unique; hence my comments at the start of this paper. My objective is to sketch an analysis we might be able to do if we had a complementary pair of languages, one revolving around the characteristics firms share, the other around their uniquenesses. The vast bulk of thinking about firms and management, in a positivist research frame, presumes the first. The point of the second is not to show the first as 'incorrect', rather it is to enrich its value by shrinking the rigor-relevance gap.

Natural language is always indexical, non-abstract, and located in a specific place and moment or by allusion to places elsewhere or moments past and future. The firm as a natural language is indexical, not the instantiation of some general language, theory, or principles. We cannot understand the essence of managing if the firm is thought to be an approximation to an abstract ideal. As a natural language it hinges on the specifics of the situation it occupies, its here and now. It hinges on what the strategist/entrepreneur knows about the situation and draws into the process of creating the firm's entrepreneurial idea. This knowledge is incomplete, indeed cannot be completed because of the fundamental uncertainties we confront. But many

things can be known in part, leading to the pluralist idea that the situation can be known in many different ways without these ever cohering into a single rational picture. We often hear the ancient story of the elephant and the seven blind men. We - standing back and seeing the elephant for what it is, and knowing each blind man's knowledge is only of the elephant's different parts - understand they cannot synthesize their separate knowings into the coherent picture we see. They never know the elephant *per se*. We can; so the story helps show how the entrepreneurial idea as a whole emerges as what is known - piece by piece - about the situation. These pieces are synthesized into the coherent idea that, creating sufficient confidence to act, effectively grasps the uncertainties through the resulting practice and opens up the possibility of profit. Yet if the resulting picture were complete and certain there would be no possibility of practice producing profit. Equally, if the situation remained so uncertain that no confidence in mindful action developed there would be no possibility of profit either. Many real world situations overwhelm us - dealing with poverty or the wealth gap. The uncertainties are too great for us to resolve, we cannot develop a workable idea of how to begin.

UNCERTAINTY

Ex definitio there can be no theory of uncertainty but it is useful to distinguish ways in which situations might present as uncertain. Each uncertainty is framed in its own epistemology for every mode of knowing implies its own mode of not knowing or 'knowledge-absence'. To illustrate; the most common type of uncertainty is 'ignorance' of what is presumed knowable. This makes sense within, and so implies, a realist or positivist view, regarding natural science as the process of building up a picture of the real, coherent and additive because we presume reality is rationally construed and discoverable. Whether or not this assumption is tenable is beside the point; for it is incontestable that practices generated and shaped by positive science have led to huge improvements in the human condition. But not all of positivist disposition pay attention to other modes of uncertainty that also affect our lives. Yet we all know that the results of our actions in the social world turn on the actions of others. This is

the founding metaphor of game theory. Instead of a single actor, the human race represented by a white-coated (male) scientist facing Mother Nature, the metaphor underpinning positivism, we have a quite different epistemological scenario - two independent actors, neither having complete knowledge of the other's potential actions. This type of uncertainty is 'indeterminacy'. Thirdly, if we accept all our knowledge is partial and incomplete, and captured in multiple immiscible languages that stand on different axioms, we are not able to bring everything we know into a single coherent worldview. This type of uncertainty is 'incommensurability'. Together they imply three utterly discontinuous epistemologies that cannot be collapsed into a single mode of knowing in the absence of certainty, the un-bounding of bounded rationality, the state Vico presumed was not available to us. But the discussion above about practice shows we can resolve all these types of uncertainty as we engage in effective goal-directed and goal achieving practice. We do not need to know completely if our practice does 'well enough'.

With these three types of knowledge-absence in mind, we can clarify the modes of human knowing and thus the strategist's intellectual task. What we know about a situation can be expressed as data, as meaning, or as effective practice (Spender 2007). Data is the antithesis of ignorance. While our senses may signal us, there is no 'raw data'. To know something, the signals have to be framed in ways that we know both what something is and what it is not. There can be no data completely severed from and thus without meaning. Data synthesized with meaning we call information. Meaning is the antithesis of indeterminacy and incommensurability; when they are present we lose sight of the meaning of our data. Meaning is problematic when we have data but cannot attach it to effective practice, when we do not know how it might shape practice. Data is unproblematic information that we can easily attach to practice. Thus by practice we mean that which is determined by 'the facts' - we know to arrive at the train station before the time dictated by the time set for its departure, when our information is more or less sufficient to our action. By effective practice we may also mean practice that is not determined by information, that we have learned in

another way - such as bike riding. Tacit knowledge cannot be regarded as information for it is not expressed and so is not within the same epistemology as information - even as it matters greatly to successfully negotiating the real world's uncertainties. In summary, data, meaning and practice are our various modes of knowing that and help us overcome inaction and thus resolve ignorance, indeterminacy, and incommensurability as our various modes of knowledge-absence.

The strategist's task of synthesizing effective action under uncertainty begins by selecting what is known about the situation, bearing in mind these multiple epistemologies and thus our various modes of knowing or of knowledge-absence. But the synthesis can only ever be indexical, made for this situation, this particular place and time. Some things are factual, data about the amount of gas in the tank as you set off on a drive. Others are matters of meaning, the impact of the flashing lights ahead on your journey time, or of the knocking sound you had not heard before - their impact being revealed, perhaps, in due course. Other things call for your previously learned skilled practice, the flashing sign says 'icy road'. Managers generally face situations bounded by all three kinds of knowing that indicate, antithetically, what they do not know, what is unknown. After collecting as much information as they can from the situation and their own reflection, they must assess their confidence in acting; judge whether to engage the uncertainties that remain unresolved by their process of discovery. As they commit to action, to jumping in with both feet, they synthesize what they know.

This is all very well but now the question becomes, since action under uncertainty is never the determined instantiation or enactment of some coherent general principle, how many considerations or variables should be taken into account since - in principle - their number is infinite in the absence of certainty? *Industry Recipes* (Spender, 1989), based on these multiple epistemologies and on the work of the psychologist George Kelly, suggested most business situations are considered within a framework of a dozen or so situation-specific languages. These can be described as constraints to the entrepreneur's mindful practice, the

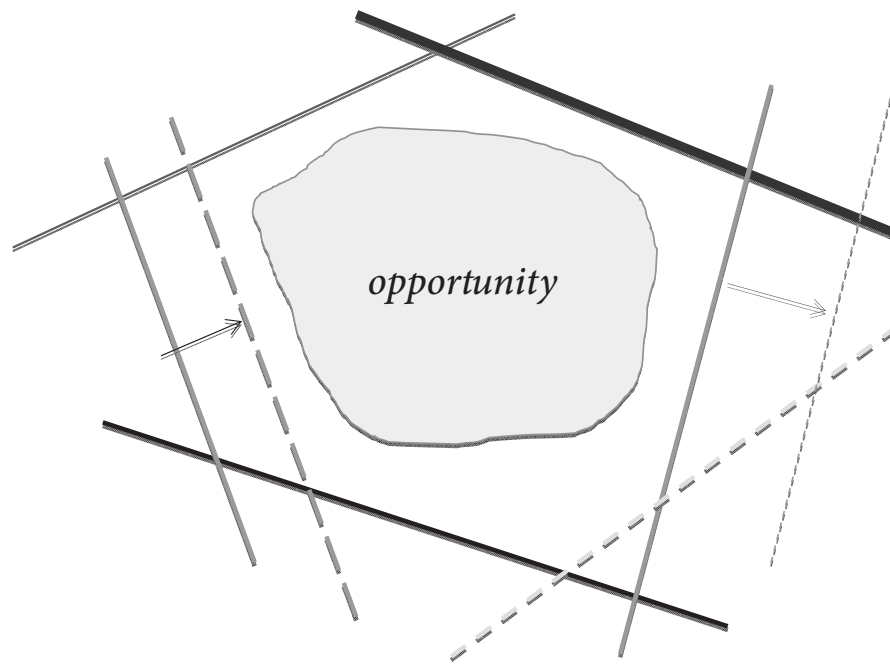


Figure 1: The multidimensional constraints that bound the opportunity space

situation's 'kickingback' against the un-boundedness of the entrepreneur's imagining. The result can be illustrated as the entrepreneur's 'opportunity space' (Figure 1) - a residual space in which practice might lead on to profit, bounded by what is known as constraints to that practice. At the same time many of these constraints are open to be modified by the firm's actions. Demand limits can be re-shaped by advertising, changing the views and behaviors of those whose actions aggregate into demand. Likewise technological limitations can be shifted by research. In an uncertain world the entrepreneur's knowing always hangs within an epistemology of the possibilities opened up through practice, not merely knowledge of the world as it is, an epistemology very different from the positivist's passive acceptance of reality's nature.

THE FIRM SYNTHESIZED

The synthesis that leads on to practice that is able to grasp and profit from a specific situation's uncertainties is the management's unique strategic/entrepreneurial product or artifact. The firm must be managed into being, not managed only after it has

been brought to life. As the situation changes, as it must all the time, the firm must be re-invented through management's further strategizing. The TMF label accentuates management's dynamic and constructive contribution and points to our discipline's present inability to answer Coase's questions from a static universalistic point of view. The TMF proposes indexical answers. There can be no universal or general ToF of which profit generating firms are logical or rigorous instantiations. We cannot speak generally about the constraints the strategist faces, only about the different modes of knowing and not-knowing, and their different susceptibilities to be acted on by the firm. Saying the entrepreneur must attend to finance, marketing, administration, human relations, and so is nothing other than a contemporary expression of POSDCORB and presumes a universal ToF. This cannot work if the firm is to open up the possibility of profit. The entrepreneurial process of discovering these constraints lays out the opportunity space the firm can occupy as a collectivity of collaborative practices. The firm arises because the strategist has synthesized the opportunity space from the uncer-

tainties and confusion of the world, so creating the opportunity, and contrived to occupy it with the resources at her/his disposal (Alvarez & Barney, 2007). Some, but not all, of the constraints arise because of resource scarcity. But the synthesizing process is not simple resource-constrained maximization, for the constraints are incommensurate and their practice implications far from obvious. Likewise the implications of a particular resource's scarcity are equally problematic. As Penrose pointed out, it is not the resources that matter so much as the services deliver to the firm (Penrose, 1959:25). She alluded to the management team's knowledge which, being itself uncertain and leveraged with their imagination, cannot ever be treated as data. The TMF addresses Coase's questions by changing them, moving them out of the positivist epistemology of universals and into an epistemology of indexicalities and practices. In its own way, therefore, the TMF explains (a) why firms exist and, as the necessary follow-up to that answer, (b) how they are brought into existence. A firm exists as a strategically constructed apparatus to bring the judgment of many to bear collaboratively on a chosen set of discovered uncertainties.

The first TMF task is synthesizing the 'idea of the firm' (Rhenman, Stromberg, & Westerlund, 1970). My earlier empirical research suggested the result involves a dozen or so dimensions (Spender, 1989). I borrowed from Chester Barnard who pointed in this direction with his analysis of the executive's function, which was to synthesize three sub-economies into the 'organizational economy' (Barnard, 1951:240). He focused on the 'system' resulting rather than on the firm-as-language that would draw people into that system. His synthesizing process (a) called for the exercise of executive judgment (what Barnard called leadership), and (b) is indexical, specific and unique to the circumstances pertaining. Unfortunately his thinking was greatly influenced by Lawrence Henderson's work on biological systems. As a result Barnard developed a passion for systems and, in consequence, failed to make anything of the distinction between formal and natural language. Today many see this as the distinction between open and closed systems, though Scott's well known arguments and analysis

of open systems fail because he too is looking for a universalist theory (Scott, 2003). More importantly in taking a systems approach Barnard was unable to avoid implying or at least allowing that the synthesis he was discussing could be formal and modelable, and so closed. Thus abandoning or even denying Knightian uncertainty, he shut out the possibility of profit - so it is interesting to appreciate Barnard paid no attention to Knight's earlier work (O'Connor, 2011). While Barnard saw a three-way synthesis, Kaplan and Norton's Balanced Scorecard implied a four-way one. We can read Porter's work as implying a 5-way synthesis (Spender & Kraaijenbrink, 2011). Here it is useful to step back into the Learned, Christensen, Andrews and Guth tradition from which Porter took off. Their synthesis was between what the firm 'might do, can do, wanted to do, and should do' (Learned, Christensen, Andrews, & Guth, 1965:20). Synthesis is an ancient concept, made more difficult because it calls for an essentially subjective and thus indexical capability. There can be no general theory of synthesizing since what needs to be done is always contingent on the specifics faced. The poet Keats referred to it as 'negative capability', the artist's ability to make sense of the pluralistic world that James referred to as "a blooming, buzzing confusion". Scott Fitzgerald indicated something similar with "the test of a first-rate intelligence is the ability to hold two opposed ideas in mind ... and still function" (Fitzgerald, 1936).

RHETORICAL CLOSURE

With the idea of the firm generated and in mind - and ready-to-hand - the strategist can engage Say's part of the entrepreneurial task, communicating the idea to others in ways that shape both their reasoning and their judging. Bureaucratic theory tells us about managing others' reasoning. The TMF presumes rhetorical activity as the means to shape others' judging. Again, as with the study of language, study of rhetoric is ancient - plus a great deal is known about how to teach the 'art of rhetoric'. Most readers will recall the pillars of Aristotelian rhetoric: *logos*, *ethos*, and *pathos* (Leith, 2011). These parallel the three ways of knowing discussed earlier, data, meaning and practice. Since, to a significant extent, we all share rationality, logical con-

clusions are a matter of reasoning about data. The essence of *logos* is the leader's appeal to the listener's reason. Present the facts and the conclusion is logical, as Mister Spock would say. Bureaucratic theory, POSDCORB, and most managers' notion of getting organized is rational on the basis of facts. The TMF shows the practice of real world management must always go beyond this, to find ways of engaging the situation's inevitable uncertainties with practice that implements judgment. The typical business situation demands more judgment than single individuals can provide. In the end we are all middle men. I sit typing depending on a vast number of others from computer makers to electricity providers, editors, publishers, and readers. Steve Jobs needed Wozniak, and later a team of people who knew, for instance, how to make scratch-free glass for the iPhone. Henry Ford needed a team of people who knew rubber, forging, hiring and firing, and so on. A firm constructs and synthesizes a division of labor, as we know from Adam Smith, along with a complementary division of the judgments necessary to bring the firm and its practices into being.

When it comes to shaping other's judgment rather than issuing instructions to be followed blindly without an exercise of judgment the leader can use natural language to appeal to the listener's *ethos* and *pathos* modes of knowing. The essence of *ethos* is meaning situated in the situation. It is often defined as shaped by the speaker's character, which is not very helpful. It is more informing to say *ethos* is about the answering the audience's question "Why should we listen to you?" - which boils down to them sharing meaning. Note that *ethos*, which is related to ethics and evaluation of the meaning of our thoughts and actions, is indexical. There can be no universal theory of meaning in an uncertain world - though many adopt such notions as axioms to their personal theories of practical living. Demanding others do the same is dogmatism, disallowing others' different beliefs. The key to *pathos* is to recall the Ancients' belief that all human action springs from emotion rather than reason. Managers have to stir and capture their listeners' emotions if directed action is to result. Rhetoric goes far beyond the process of persuading people to agree with opinions they did not hold previously. All is for naught if purposive practice is not the result.

Managing does not bear fruit until effective practice grasps chosen uncertainties and, applying resources, transforms them into profit. Disciplined rhetoric complements disciplined imagining as the key components of the TMF, thereby answering Coase's questions. But the answers are neither general nor definitive. In a sense the answers to Coase's question are all the same - "exercise managerial judgment!" A firm exists because a particular entrepreneur has judged it the appropriate means to achieve a particular goal. The firm's boundaries are where they are because the entrepreneur has judged them appropriately positioned to her/his make-or-buy position - and so on. The TMF claims managerial judgment is the firm's armature.

CONCLUDING COMMENTS

It seems our discipline does not take Knightian uncertainty seriously, even as we note Knight's influence. His work opened up the puzzle of mindful profit-seeking and economic growth but has generated little follow up. Given we generally assume firms exist to make money and presume management is towards this end, it is curious that the bulk of our discipline's research and teaching is hung in an epistemology that rules profit and growth out of the analysis. At one level this is simply a curious academic puzzle, an overlooked Kuhnian anomaly. But we edge into a region of intellectual violence if we teach on the basis of theories that deny profit for our students are surely headed into an environment in which profit may well be everything. Our uncertain world is pluralist and democratic and so host to many different endeavors, some academic, some political, some commercial, so there are 'horses for courses', different theories to shape mindful action towards different ends. No single way of thinking suffices. Business schools may well be able to make good use of various theories about how the economy and its actors function without having to embrace the specific axioms, presuppositions, and methods that enable us to think about profit. But at the same time we cannot deal with our intellectual and pedagogical responsibilities to our students if we ignore the implications of having no answers to Coase's questions. Knight's insight into the relationship between uncertainty and profit opened up a new way to address them. The TMF offers a way of

thinking about their indexicality and their being in the realm of practice rather than the realm of rational abstraction. Being hung in a non-positivist epistemology it is not a 'theory' in the conventional abstract sense. Rather it is hung in lived indexical world where it might be able to guide to those seeking profit through uncertainty resolving practice.

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Dr. John-Christopher Spender is Visiting Professor of the Department of People Management and Organisation, Ramon Llull University, Spain. jcsponder@yahoo.com