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Expectations and Confidence under Uncertainty

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Expectations and confidence under uncertainty

This paper deals with the determinants of the state of expectation of individuals¹ facing uncertainty. The objective of the individual and his or her state of expectation are the main determinants of deliberate behavior, or decision making. The paper concentrates on fundamental uncertainty, but the scheme of analysis presented here is general enough also to cover both situations of probabilistic risk (or weak uncertainty) and ambiguity as special, simpler cases.²

A preliminary discussion is required about the concept of fundamental uncertainty (see also Dequech, 1997).

Preliminary remarks: fundamental uncertainty, knowledge, and gradability

Fundamental uncertainty refers to situations in which at least some essential information about future events *cannot be known at the moment*

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¹ This should not prevent one from dealing with situations in which decision making is a collective process. A decision-making unit composed of different people may be said to have a state of expectation, the determinants of which result from the interaction of different people. (Individuals are not conceived of in atomistic terms.)

² The distinction between risk and uncertainty has been rejected by several mainstream subjective probability theorists (since de Finetti and Savage), while other scholars have insisted on its relevance. There is one notion of uncertainty that goes beyond the standard treatment in mainstream economics but still falls short of fundamental uncertainty concepts. The former is termed ambiguity by Ellsberg (1961). Camerer and Weber's (1992, p. 330) definition of ambiguity helps to distinguish this term from fundamental uncertainty: "Ambiguity is uncertainty about probability, created by missing information that is relevant and could be known." From the perspective adopted in this paper, a very important characteristic of ambiguity problems is that, even though the decision maker does not know with full reliability the probability that each state of the world will obtain, he or she knows *all the possible states of the world*.

of decision because this information does not exist and cannot be inferred from any existing data set. In an environment where there is fundamental uncertainty, future actions can be created by today's decisions. The best example of such creativity in the economic sphere is the introduction of technological or managerial innovations, as in Schumpeter's process of creative destruction. Important structural changes can also be of a political, social, or cultural nature. Surprises can occur as an intended or an unintended consequence of human action. In this sense, *the future is yet to be created* (see Shackle, e.g., 1972, pp. 399–400, and, more recently, Bausor, 1983, 1985, and Davidson, 1991a).

This characterization of fundamental uncertainty is basically an ontological one. This ontological criterion has been adopted by Davidson (1996) to distinguish uncertainty from other situations, based on the difference between what he calls a transmutable and an immutable reality.

This ontological view of uncertainty inevitably has a counterpart in terms of the type of knowledge that people can or cannot have under fundamental uncertainty. The ontological conception of economic reality as subject to the possibility of unpredictable future structural change is adopted here. The counterpart of this ontological conception in terms of knowledge is fundamental uncertainty. But does fundamental uncertainty imply complete absence of knowledge regarding future events, that is, complete ignorance? The type of knowledge of reality that it is possible for individuals to possess depends on the characteristics of reality. The question therefore becomes: Is there an ontological basis for some knowledge in a transmutable reality? The answer depends on whether there is more to the ontology of such a transmutable reality, as well as on the notion of knowledge adopted by the analyst.

The existence of social practices (i.e., laws, conventions, and customs) tends to lend some stability (or inertia) over time to the existing reality.³ The existence of legal contracts is associated with another institution, the state, which is supposed to possess the power to enforce contracts. If individuals believe in the enduring nature of these institutions, which are a feature of the transmutable reality in which we live, then they may believe they possess some knowledge of potential future outcomes, even in a transmutable reality.

Consequently, fundamental uncertainty need not imply complete ignorance of all aspects of the future. In such circumstances it is possible

³ A deeper discussion of the notion of knowledge would require a consideration of issues of philosophy of science that is avoided here.

to denote different degrees of fundamental uncertainty, in ordinal rather than cardinal terms.⁴ Individuals cannot know exactly how ignorant they are, as the future is yet to be created. No standard of complete knowledge or complete ignorance exists to provide a reference against which to measure our actual ignorance. Nevertheless, individuals are more ignorant at least about some things—such as possible future values of nominal variables—in some situations than in others, the difference between these situations depending on the existence and prevalence of stabilizing institutional practices. It is in this specific sense that the degree of fundamental uncertainty can be larger in some circumstances than in others.⁵

The determinants of the state of expectation: the general scheme

Keynes (1936, p. 148) suggested that the state of expectation depends on expectations themselves and on the confidence in them.⁶ A similar distinction between expectations and confidence appears in Knight (1921, p. 227).⁷ An attempt is made in this paper to distinguish between several determinants of the state of expectation and establish the relations between them (see figure 1).⁸

Expectations and confidence are the *immediate* determinants of the

⁴ Keynes himself treated uncertainty as gradable. For example, he used the expression “very uncertain” in *The General Theory* (p. 148n, emphasis added), referring the reader to his TP chapter on weight. Even in his 1937 *Quarterly Journal of Economics* 1937 article, where he emphasizes a radical type of uncertainty, he refers to some things as “slightly” or “moderately” uncertain (1973b, p. 113, emphasis added).

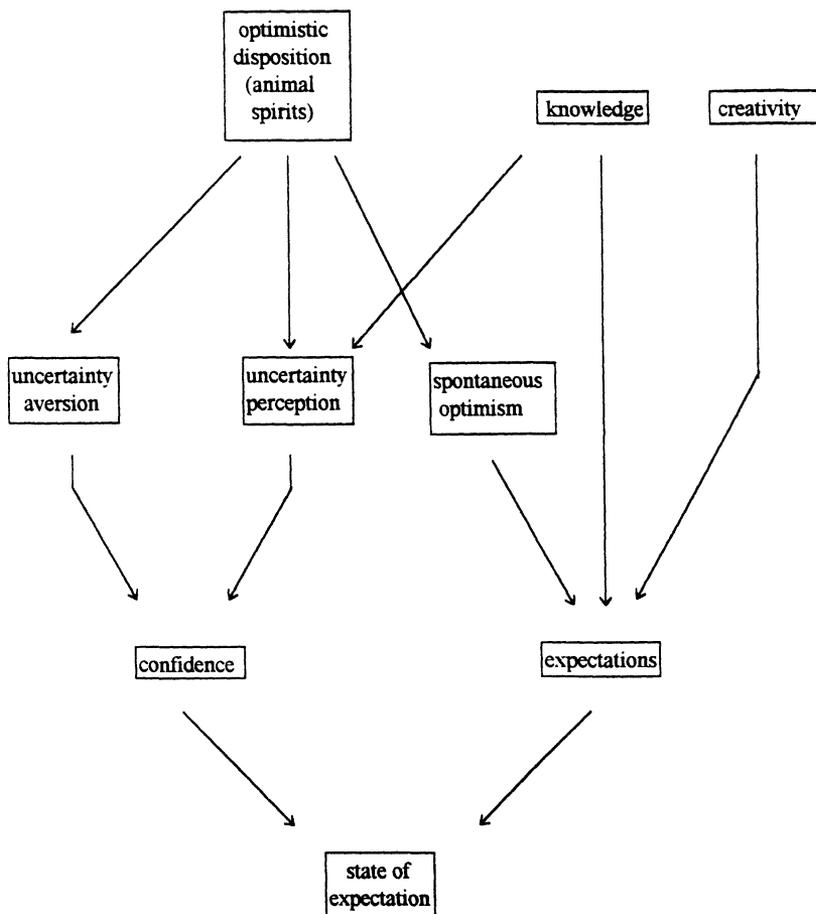
⁵ Post Keynesians who accept the gradability of uncertainty, sometimes also referring to the role of institutions in reducing it, include Kregel (1980, p. 46; 1981, pp. 69–70), Harcourt (1981, p. 261), Carvalho (1992, p. 210), Dow (1995), and Minsky (1996, pp. 359, 364). Among neo-Schumpeterians, Freeman (1982, pp. 149–150) argues for the gradability of uncertainty even about innovations themselves.

⁶ Keynes refers to confidence and to the state of confidence. They are treated here as the same thing, as it seems to be the case in *The General Theory*. Whereas Keynes refers to the most probable forecast, reference is made here to expectation, in order to include the case in which an expectation cannot be related to a probability, not even a nonnumerical one.

⁷ See Ellsberg (1991, p. 660), Runde (1995, p. 334) and Langlois and Cosgel (1993, pp. 459–460). Gerrard (1995) substitutes credence for confidence. Favereau (1988, p. 157) equates confidence with credibility, a term borrowed from Georgescu-Roegen (1958). However, Georgescu-Roegen’s concept is not clearly applied to situations of fundamental uncertainty.

⁸ This schema is applicable not only to investment decisions but to any decision involving fundamental uncertainty.

Figure 1



state of expectation. There are three *ultimate* determinants of the state of expectation: *knowledge*, *creativity*, and *the optimistic disposition to face uncertainty*. As already noted, fundamental uncertainty does not imply complete ignorance, and some knowledge regarding at least some nominal values is possible if one presumes the sanctity of legal contracts, and the like. On the other hand, whatever knowledge decision makers have under uncertainty, this knowledge is necessarily substantially incomplete. Moreover, complete knowledge cannot exist at the time of making the most relevant economic decisions. An individual may use the available information, as well as his or her tacit knowledge of institutions, but this knowledge has to be supplemented by something else. If the future is not predetermined by some time-immutable economic law, then human

creativity can play an important role in determining the future. At least some individuals may be creative.⁹ For each person, creativity may be strong, weak, or even absent. Finally, in the schema of figure 1, there is the optimistic disposition of the individual to face uncertainty. This disposition concept is a broad notion encompassing different elements. Some, but not all, of these elements will be given specific names in what follows, such as spontaneous optimism and uncertainty aversion.

The role of each of the three ultimate determinants—knowledge, creativity, and the optimistic disposition—depends on which of the immediate determinants—expectations and confidence—is considered. The factor through which the optimistic disposition influences expectations is termed *spontaneous optimism*. Expectations are directly determined by knowledge, spontaneous optimism, and creativity. Uncertainty in a fundamental sense is by definition characterized by the absence of reliable knowledge about all aspects of the outcome of any decision. Expectations based on a combination of knowledge, spontaneous optimism, and creativity, therefore, are never fully reliable either. The decision to act, or to refrain from acting, has to depend on confidence as well.

Creativity in this scheme only affects expectations; it does not affect confidence. The latter is ultimately determined by both the optimistic disposition and knowledge through their influence on *uncertainty perception* and *uncertainty aversion*,¹⁰ that is, how much uncertainty an individual perceives and how willing the person is to face or to avoid this uncertainty.

The optimistic disposition to face uncertainty, or animal spirits redefined

This optimistic disposition concept is similar but not identical to what Keynes (1936, pp. 161–162) called “animal spirits.” Keynes (1936,

⁹ Keynes did not attribute any explicit role to creativity when discussing the state of expectation. However, he did refer, for example, to inventions in his treatment of uncertainty (1937, pp. 113–114; see also 1936, pp. 141, 252).

¹⁰ The notion of uncertainty aversion proposed here is not the same as that in generalized Expected Utility Theory (see Schmeidler, 1989, pp. 574, 582; Karni and Schmeidler, 1991, p. 1805). Although some versions of that theory depart from the standard, weak notion of uncertainty (risk), they focus on ambiguity rather than on fundamental uncertainty. Thus, uncertainty aversion in this literature usually means ambiguity aversion, an expression also commonly used in this context. This paper therefore distinguishes not only between risk aversion and ambiguity aversion, but also between the latter and aversion to fundamental uncertainty.

p. 161) identifies “animal spirits,” or “spontaneous optimism,” as that which lies behind “our positive activities,” “our decisions to do something positive.”¹¹ Even though the expression “animal spirits” is sometimes used in what follows, it does not mean merely “a spontaneous urge to action rather than inaction” (Keynes, 1936, p. 161). In our scheme, situations of fundamental uncertainty are not reduced to a simple dichotomy between action and inaction; rather, there can be *different types of action*, depending on the quality and the intensity of the optimistic disposition. The idea to be conveyed is that of a disposition that comes in (ordinal) degrees and is combined with optimism or pessimism.¹²

Keynes did not explicitly distinguish the influence of animal spirits on expectations and on confidence. Animal spirits have sometimes been identified as that which provides confidence in expected returns (e.g., Dow and Dow, 1985, pp. 47–49; Brothwell, 1986, p. 536; Dow, 1991a, p. 154, 1991b, p. 179; Lavoie, 1992, pp. 47, 49). In the present scheme of analysis, this interpretation is not quite right. First, for the sake of precision, animal spirits should be associated not only with confidence but also with the optimistic or pessimistic character of expectations. In the case of product markets, if a decision maker is pessimistic in the sense that he or she believes that future demand will be very low and has strong confidence in this belief, he or she cannot be said to have strong animal spirits in Keynes’ sense (see Crotty, 1994, p. 114). Second, as discussed in the next section, confidence does not depend only on animal spirits.

Animal spirits affect not only confidence but also expectations themselves, via spontaneous optimism. Spontaneous optimism means optimism not based on any knowledge.¹³ If animal spirits are very strong, then the estimates will be spontaneously optimistic and the confidence in them will be high. The weakness of animal spirits leads to low confidence and to lack of spontaneous optimism or, in a more severe case, to spontaneous pessimism.

¹¹ Keynes (1936, p. 150) refers also to “sanguine temperament and constructive impulses.” On Keynes’ notion of animal spirits, see also Carabelli (1988), Matthews (1991), Meeks (1991), Koppl (1991), and Moggridge (1992).

¹² Except when I refer to another author’s use of the expression, what is meant by animal spirits here is the optimistic disposition to face uncertainty. The two expressions are used interchangeably.

¹³ In contrast, for example, if a person knows that the chances of winning a lottery are 90 percent, that person may be optimistic, but this is not spontaneous.

Animal spirits should not be seen as purely subjective or psychological.¹⁴ Animal spirits are influenced by the institutional environment in which an individual operates.¹⁵ At the same time, some degree of subjectivity in animal spirits is inevitable. Animal spirits are partly endogenous (and the more so, the more institutions are incorporated into one's analysis), partly exogenous. The same applies to expectations and confidence.

Confidence: uncertainty perception and uncertainty aversion

Confidence is jointly determined by uncertainty perception and uncertainty aversion. Uncertainty aversion is solely a question of animal spirits, whereas part of the uncertainty perception may have a basis in knowledge and thus may be independent of animal spirits. The relation between animal spirits and uncertainty perception is a difficult one to establish, but animal spirits can be seen as also affecting uncertainty perception.¹⁶

The knowledge involved is that of the existence of uncertainty itself and of factors that reduce or increase uncertainty, namely, social practices

¹⁴ If they were, then perhaps they could be invoked to explain any decision. See Crotty (1994, p. 115), Heap (1986, p. 268), and Chase (1994, p. 214). Keynes might have sometimes referred to animal spirits in a purely subjective way, but there is also support for an account of Keynes as nonsubjectivist—see Lawson (1985), Rotheim (1989–90, 1995), McKenna and Zannoni (1993, pp. 402–403), Davis (1994a, 1994b), and Rymes (1994).

¹⁵ Davidson (1991b, p. 38) talks of investment being influenced by “an entrepreneurial culture” (also Matthews, 1991, p. 110; Hargreaves-Heap, 1986–87, p. 272). The argument applies also to other decisions. The firm is an important unit of analysis in this regard—culture varies from firm to firm. Hodgson (1989) suggests a link between Post Keynesianism and institutionalism. This indeed seems to be the case here, since institutions for the institutionalists are similar to what social scientists understand as culture (Neale, 1987, pp. 228–229).

¹⁶ Animal spirits may influence uncertainty perception on a conscious level or, as Dow (1995) seems to suggest, on an unconscious level, by leading the decision maker unconsciously to ignore evidence regarding the degree of his or her uncertainty. Moreover, the decision maker may consciously decide to ignore evidence that reveals ignorance and to pretend that uncertainty is lower than in reality. The decision maker may do so in order to lead other people, in a meeting with shareholders, for example, to believe that he or she knows more than he or she actually does. This would make it easier for the decision maker to employ a pretty, polite technique, “made for a well-panelled board-room” (Keynes, 1937, p. 114). There is a suggestion of this in Dow (1991a, pp. 157–158). See also Keynes’ (1936, pp. 161–162) statement that “Enterprise only pretends to itself to be mainly actuated by the statements in its own prospectus, however candid and sincere.”

such as contracts, market makers, and so on. This does not mean that the degree of uncertainty is perceived in a completely objective and precise way, since knowledge itself is not completely objective. Moreover, one cannot be certain of how uncertain one is.

Knowledge is conditioned by the social context in which it is produced. This implies the possibility or even the necessity of different views on what is considered knowledge. This leads to different theories of economic reality. One's theory of economic reality is, in turn, crucial for his or her assessment of uncertainty. Accordingly, there are also different views on how much uncertainty is faced by decision makers in economic contexts. Uncertainty perception may even be negatively affected by the existence of economic theories that neglect fundamental uncertainty.

An important point in this regard is that economists influence how noneconomists see reality (see also Palley, 1996, chapter 6). The mainstream view in academic economics neglects fundamental uncertainty. This view is considered a form of knowledge, supported by the prestige of the universities in which it is taught and of the journals in which it is published. Some decision makers may adopt this view, by, for example, studying economics or business, hiring as employees and consultants people who have been trained in the mainstream, and so on. Hicks (1977, p. vii) states that people know that they do not know, but other economists may tell them the contrary. This is why it is better to say that people *may* know that they do not know, meaning that they may be aware of fundamental uncertainty.

In sum, animal spirits are not just confidence, because they are associated with optimism; nor is confidence just animal spirits, because it may have a more concrete foundation.

Creativity

The influence of animal spirits on expectations may be distinguished from that of creativity. Animal spirits, through spontaneous optimism, condition the way a decision maker creates the future in his or her mind. In this sense, animal spirits could be said to affect creativity (see Carvalho, 1988, p. 77n). In the present analysis, however, creativity is interpreted as an ability to see and do things in a novel way. Creativity in expectations is expressed as an innovative imagination, that is, as the ability to imagine a future that is, at least in some respects, radically different from the present (or, if creativity is weak, a future that is in all

respects essentially similar to the present). For example, a person may think of an innovation. If he or she is sufficiently optimistic about the payoff from using this innovation and his or her uncertainty aversion is sufficiently low, then the innovation will be put into practice, provided finance is available. Creativity as conceptualized in this paper includes also the decision maker's ability to consider that other people, in particular his or her competitors, may implement innovations and that other types of structural change, for example, of a political, social, or cultural character, may take place in the future.

What is the relation between creativity and knowledge? "Almost by definition, trying to do a new thing involves the impossibility of knowing what the new thing will look like, what its economic properties will be, what is the best way of doing it and even what are the feasible ways of achieving the result, if any" (Dosi and Orsenigo, 1988, p. 18; see also Freeman, 1982, chapter 7). This does not mean that innovation cannot be based on any knowledge at all. First, it requires knowledge of what is already available. Furthermore, "whenever innovative activities are undertaken by profit-motivated agents, they must also involve some sort of perception of yet unexploited, technical and economic, opportunities" (Dosi, 1988, p. 222). "However," Dosi continues, "such perceptions and beliefs rarely entail any detailed knowledge of what the possible events, states-of-the-world, input combinations, product characteristics will be."

It is difficult to say something general *a priori* concerning the relation between knowledge and innovative behaviour. An important question is whether one is discussing a particular innovative decision or innovation as a larger process. It could be argued that a particular innovative decision can be based on the knowledge acquired in R&D laboratories and in marketing research, so that the decision maker may have good reasons to expect the innovation to work. Even so, the previous investment in R&D or in marketing research necessarily involves a great deal of uncertainty (see, e.g., Kay, 1988, pp. 282–285). At some stage, the process of innovating involves trying what has never been tried before and thus involves an absence of knowledge. The same applies to examples of creativity other than innovations.

The partial exogeneity of expectations must be related not only to animal spirits, but also to creativity. As in the case of animal spirits, there are factors affecting creativity that are particular to a single individual, to his or her experiences and his or her personal reactions to those experiences. At the same time, creativity is also influenced by the institutional or cultural context.

Confidence and weight

O'Donnell (1989, p. 267) argues that there is a parallel between the expectations-confidence pair in *The General Theory* (GT) and the probability-weight pair in *A Treatise on Probability* (TP). Unfortunately, this parallel has been pushed too far. The increasing number of references to the relation between confidence and weight, in particular, justifies an examination of this issue, from both a doctrinal-historical and a theoretical point of view.

Several authors treat confidence and weight as the same thing (Minsky, 1975, p. 65; Kregel, 1987, pp. 525–527; Carvalho, 1988, pp. 76–77; Carabelli, 1988, p. 224; Dutt and Amadeo, 1990, p. 105; Lavoie, 1992, pp. 47, 49; Camerer and Weber, 1992, p. 327; Darity and Horn, 1993, p. 26; Brady, 1993, p. 372; Anderson and Goldsmith, 1997, p. 72). Keynes (1936, p. 148) does equate confidence with the inverse of “how highly we rate the likelihood of our best forecast turning out to be quite wrong.” Some might interpret this as suggesting that he is thinking in terms of weight. Keynes (1936, p. 149), however, also relates confidence to “business psychology,” and there is no clear connection with weight at this point.

The equality between weight and confidence in Keynes is also questioned by other authors. After showing that weight in the TP has more than one meaning, Runde (1990, pp. 286–287) argues that for Keynes weight and confidence are not the same thing, although they tend to move in the same direction (see also O'Donnell, 1991a, pp. 83–84, and Gerrard, 1995, p. 190). Since confidence can fall with new evidence, weight in this case cannot be the absolute amount of relevant evidence; it has to be the relevant evidence's degree of completeness. Hoogduin (1987) oscillates between different meanings of weight without identifying them; nevertheless, he also distinguishes between weight and confidence. Both Runde and Hoogduin seem to interpret weight as an objective measure,¹⁷ while confidence would be more subjective or psychological.

Weight and confidence must be distinguished. Weight is linked to perceived uncertainty, while confidence depends also on uncertainty aversion.¹⁸ Fundamental uncertainty implies that complete information *does not exist* at the time of decision. It is *relatively* not difficult to

¹⁷ Contrast this with Kregel (1987, p. 526) and Rymes (1994, pp. 152–153).

¹⁸ Another difference results from the distinction between probability and expectations. Weight in the TP is associated with a probability relation, whereas confidence in Keynes' later writings refers to expectations that are not necessarily based on probable, even if nonnumerical, knowledge.

discuss the evidence's degree of completeness in problems that involve ambiguity. Keynes' notion of weight, therefore, can be used in a *relatively* straightforward way and provide a measure of ambiguity.¹⁹ In contrast, situations of fundamental uncertainty are such that decision makers cannot precisely establish how complete their information is about the future, since the future is *yet to be created* by people's actions. There is no predetermined full amount of information to provide a standard with which the completeness of actual information can be compared.

Keynes, in *The General Theory* (1936, pp. 148n, 240n) and again in a 1938 letter to Townshend (1979, p. 293), seems to suggest that the notion of weight might be used when dealing with fundamental uncertainty. Nevertheless, if weight is to be used in the sense of the evidence's degree of completeness (so that weight can be related to confidence), it cannot be implied that complete information exists at the time of decision under fundamental uncertainty. This difficulty in applying weight to situations of fundamental uncertainty has been neglected by those who suggest that weight be used as a measure of uncertainty,²⁰ with the possible exception of Runde (1990, p. 283), who admits that "we can never say how complete our information is at any point." The notion of weight has been applied both to ambiguity and to fundamental uncertainty, but it is important to distinguish these two situations.²¹

The optimistic disposition and inaction

Confidence depends on the optimistic disposition to face uncertainty and on how knowledge influences uncertainty perception. The larger

¹⁹ The concept of weight, in general and not only in Keynes' work, still awaits proper clarification (Hamouda and Rowley, 1996, p. 121) and involves rather complicated issues (Cohen, 1985). There is no implication here that weight could be measured nonarbitrarily in situations of ambiguity. For a suggestion that it could not, see Cohen (1985, pp. 274–275).

²⁰ Anand (1991) is most explicit in saying that Keynes saw weight as a measure of what he called uncertainty in his later writings. See also Hoogduin (1987) and O'Donnell (1991b).

²¹ In *A Treatise on Probability*, weight in the sense of the evidence's degree of completeness is equivalent to weight defined as the balance of relevant knowledge and relevant ignorance (Runde, 1990). Weight is necessarily low in situations of fundamental uncertainty. The possibility of creativity and unpredictable structural change, which is an ontological feature of these situations, affects weight by implying incompleteness of evidence and significant ignorance. Relevant ignorance increases with the possible breakdown of stabilizing social practices. With new evidence showing this breakdown, weight would become even lower. So would, *ceteris paribus*, confidence.

the uncertainty perception and uncertainty aversion are, regarding some expectations, the stronger will be people's inclination not to act; they will prefer to postpone a decision to act indefinitely. In many economic decisions, this inclination not to act corresponds to liquidity preference.²²

The liquidity premium mentally attributed to money and other liquid assets by each decision maker is inversely related to the confidence he or she has in his or her estimates of the total returns from *holding* less liquid assets (the returns from *waiting* to buy liquid assets, which are associated with the speculative demand for liquidity, are not considered here).

In chapter 17 of *The General Theory*, Keynes (1936, p. 240) clearly establishes an inverse relation between the liquidity premium and confidence.²³ This relation is even clearer in the QJE article: "our desire to hold money as a store of wealth is a barometer of the degree of our distrust of our own calculations and conventions concerning the future. . . . The possession of money lulls our disquietude; and the liquidity premium which we require to make us part with money [or which we implicitly attribute to money] is the measure of the degree of our disquietude" (Keynes, 1937, p. 116). This idea is generalized here by including the distrust of unconventional expectations, such as those of the Schumpeterian entrepreneur.

Although they are very often discussed separately, animal spirits and liquidity preference are intimately, and inversely, related. Paraphrasing Keynes, one could say that liquidity preference has to do with an urge for inaction, rather than action. Animal spirits have been redefined as a gradable optimistic disposition to face uncertainty; accordingly, liquidity preference is also treated as gradable. The weaker the optimistic disposition, the stronger the liquidity preference and the larger the share of liquid assets in the decision maker's portfolio.

If liquidity preference is seen as the face of a coin, the optimistic

²² This behavior represents an important violation of standard Subjective Expected Utility theory. It corresponds to a refusal to bet and prevents the elicitation of subjective probabilities.

²³ Keynes (1936, p. 240n; 1979, p. 293) relates the liquidity premium to the TP notion of weight. This reinforces the connection established above between confidence and weight. See also O'Donnell (1989) and Runde (1994). Cottrell (1993, pp. 47–48) also notes this connection but doubts that weight is the appropriate notion to link with confidence. At least some of the problems he raises derive from the fact that Keynes is not always consistent in defining weight. It should be stressed again that the liquidity premium depends not only on uncertainty perception (and therefore on weight) but also on uncertainty aversion, since both factors determine confidence.

disposition accounts for only part of the other face. Liquidity preference can vary due to the factors independent of the optimistic disposition that cause an increase in perceived uncertainty. One example of this would be the breakdown of institutional practices that have promoted stability.

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