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# Uncertainty in perspective: Building a comparative framework

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## Abstract

**Motivation:** Creating a framework to categorize and, by it, deduce assumptions about uncertainty in the work of economists, even when uncertainty isn't explicitly stated. Using this framework on a similar base of authors, Davidson used it to create his taxonomy.

**Aim:** The primary aim of this article is to introduce a new tool for comparing different perspectives on uncertainty; the secondary aim is to categorize various viewpoints of chosen authors from Post Keynesian and Austrian school of Economics and infer implicit assumptions about uncertainty based on these categorizations.

**Materials and methods:** The methods employed in the article are integrative review, Davidson taxonomy, and a comparative framework called modified taxonomy. Materials consist of chosen works of economists from Post Keynesian and Hayek to replicate, to some extent, selection of authors from the original work of Davidson, which introduced his taxonomy.

**Results:** The analysis indicate that authors promoting decentralized solutions such as market perceive uncertainty as stemming from external to economy sources, whereas authors promoting more centralized solution (one that need some sort of guarantee) is seeking uncertainty from human's ability to create future independent by autonomous decisions.

**Keywords:** *risk; uncertainty; Post Keynesian; Austrian School of economics*

**JEL:** B53; E12; B22

## 1. Introduction

This article examines the perceptions of uncertainty by the Post Keynesian (PK) and Hayek as a member of Austrian School of Economics (ASE). Assumptions are significant in this context because economists' perspective on the nature of uncertainty affects their understanding of how, or by whom, uncertainty should be countered.

The second part discusses the literature on the definition of uncertainty. The third part presents the literature of the Post Keynesian and Hayek, followed by Davidsons taxonomy and modified taxonomy. The fourth section analyses chosen PK and ASE literature implementing a modified taxonomy and discusses the results. The fifth section shows the results and summarizes the differences between the discussed schools.

## 2. Literature review: definition of uncertainty

The concept of uncertainty has fascinated economists and researchers for decades, as it challenges traditional notions of rationality, equilibrium, and predictive models. To begin with, it is important to define what uncertainty means. To do so, three definitions from economists who have had a considerable influence on the theory of uncertainty was selected. The choice of authors follows the historical development of the term in economics. In 1921, Frank Knight started the modern debate about uncertainty in economics. His definition is useful for comparison with later-developed definitions. Both Keynes and Shackle are influential figures in their respective schools (PKE and ASE) that have written about uncertainty.

Knight's definition is widely recognized as the classical definition for modern debates about uncertainty. Considering both the definition itself and the historical context, the primary purpose is to distinguish between certainty, risk, and uncertainty. At the same time, Knight's departure from the assumption of economic certainty led him to view uncertainty only as a divergence from risk.

"It will appear that a measurable uncertainty, or "risk" proper, as we shall use the term, is so far different from an unmeasurable one that it is not in effect an uncertainty at all. We shall accordingly restrict the term "uncertainty" to cases of the non-quantitative type" (Knight, 1921 p. 20).

Keynes' definition provides an example of the ontological uncertainty perspective in economics. This perspective appoints uncertainty as a lack of scientific knowledge, which serves as the basis for individuals to optimize their decisions. In Keynes' works, uncertainty is fundamental to his framework, and it diverges from risk-based equilibrium, making his framework unexplainable by neoclassical equilibrium theories.

"By "uncertain" knowledge, let me explain, I do not mean merely to distinguish what is known for certain from what is only probable. The game of roulette is not subject, in this

sense, to uncertainty (...). The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence. (...) About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know" (Keynes, 1937 p. 113).

Shackle's definition distinguishes between uncertainty and probability but does not restrict uncertainty to non-quantitative forms or to any specific type of uncertainty. From a history of economic thought perspective, Shackle was a disciple of Hayek on one hand and a great contributor to Post Keynesian economics, particularly Davidson's view of uncertainty, on the other. He tried to build a theory of decision-making under uncertainty from an individual's perspective without presupposing any or almost any knowledge of the world.

"The view that I seek to combat is that we can analyse and understand the conduct that men adopt in face of uncertainty, that is, in the kind of situation which confronts them when their choice, of action must be made amongst non-divisible non-seriable experiments, by supposing them to use an actuarial outlook and procedure" (Shackle, 1953, p. 4).

All these definitions differ from each other, but they are all opposed to both certainty (meaning full knowledge of all individuals) and probability. This is because probability calculations cannot be used for situations described by these definitions. Knight's definition may appear to best describe uncertainty, but since economists after Knight tried to measure uncertainty without using probability calculus, labelling uncertainty as 'non-quantitative' may put too many limitations on the notion of uncertainty. Similarly, the definition of Keynes is constrained towards a certain type of uncertainty, which puts too many limits on the definition. For the purposes of this article, the definition provided by Shackle is most appropriate. This definition distinguishes between uncertainty and certainty, without limiting itself to either non-quantitative uncertainty or a specific type of uncertainty.

### 3. Materials and methods

**Materials and methods** Various research methods were employed in this study. The first of these was a review and critical analysis of literature on uncertainty in the publications of selected economists. This article uses an integrative review, as defined by Snyder (2019, p. 335), to select articles from both the Post Keynesian and Hayek that are linked to uncertainty, particularly the notions used by Davidson to develop his taxonomy. The works included in this selection are those of Davidson himself, which contain both his original ideas and his contributions to the understanding of Keynes' works. Also included are the works of Hayek, particularly in Davidson's efforts to distinguish Post-Keynesian and Austrian School of Economics concepts of uncertainty in his 1989 publication. Additionally, the works of Post-Keynesian authors on the gradability of uncertainty are included, as Davidson is part of this debate, and the issue is closely related to the scope of his taxonomy.

#### 3.1 Uncertainty Perspective in Post Keynesian School

One of the most important figures in PK's notion of uncertainty is P. Davidson. His taxonomy of uncertainty, distinguishing between ergodic and nonergodic reality, as well as his use of this distinction to compare PK uncertainty with that of other schools, provides a useful framework for arranging different notions of uncertainty in economics. Davidson emphasizes the importance of institutions under uncertainty, particularly contracts and liquidity preferences, in literature influenced by Keynes and his own work. "The social institution of money and the civil law of contracts enables entrepreneurs and households to form sensible expectations regarding the certainty of cash flows (but not necessarily real outcomes) over time. (...) Successful entrepreneurs feeling the animal urge to action in the face of uncertainty will not make any significant decisions involving real resource

commitments until they are sure of their liquidity position, so that they can meet their contractual (transaction demand) cash outlays over time. By using fixed forward money contracts requiring performance and payment at specified future dates, entrepreneurs (and households) can efficiently control the sequencing use of, and payment for, resources in time-consuming production and exchange processes. "(Davidson 1991, p. 138) Although economic variables in the future may be uncertain, individuals are compelled to fulfill future contracts under the threat of equal or greater penalties if conditions are not met. Therefore, people can be certain that either their contract will be fulfilled, or they will be reimbursed the equal value. The existence of monetary contracts also creates a need for liquidity to fulfill the contract's monetary conditions. This has further consequences for the economy, as money can no longer be neutral since it is seen as valuable for its liquidity purposes. Another perspective in the writings of Post Keynesian economists and Keynes himself is the gradability of uncertainty. Some authors, such as Runde (1990), Dow (1996), Dequech (1997), and Crocco (2002), interpret Keynes' weight of argument from *A Treatise on Probability* (1921) as the 'degree of completeness of the information set on which a probability is based' (Runde 1991, p. 281), which presumes the gradability of uncertainty. This interpretation suggests that the level of an individual's confidence and uncertainty is directly related to their relevant knowledge and relevant ignorance about an event. In other words, events that are closer to the present date are more like past and present events than events that will happen in the future. It is important to avoid assuming stability in the economic environment. Individuals can gain knowledge about the future and become aware of their lack of knowledge about it. However, this interpretation assumes a level of ergodicity or repetitiveness in the world, which some authors, such as Davidson (1982–1983, 1989, 1991, 1995), argue does not exist.

### 3.2 Austrian perspective: Hayek

The Austrian School of Economics is a large and diverse school of thought, with two main figures in the field of uncertainty theory: Friedrich von Hayek and his student G.L.S. Shackle. Both wrote about uncertainty from a radical methodological individualism perspective, but for the purposes of this analysis, Hayek's perspective will be presented as the ASE theory of uncertainty. Hayek held the view that it is impossible for all information to be unified in one mind. This section further explores this notion, citing Hayek to establish his approach: "On certain familiar assumptions, the answer is simple enough. If we possess all the relevant information, if we can start out from a given system of preferences, and if we command complete knowledge of available means, the problem that remains is purely one of logic. (...) This, however, is emphatically not the economic problem which society face. (...) The reason for this is that the "data" from which the economic calculus starts are never for the whole society "given" to a single mind which could work out the implications and can never be so given" (Hayek, 1945, p. 2). Hayek distinguishes himself from the risk-based neoclassical view by emphasizing the existence of uncertainty, which arises from the fact that data can never be fully given to one mind. He argues that if society could theoretically overcome its barriers, uncertainty would disappear. However, Hayek also acknowledges that better statistical knowledge alone cannot fully tame uncertainty. Hayek holds the view that if there were a central board, uncertainty would disappear. However, he believes that such a board cannot exist. In Hayek's own words: "We cannot expect that this problem will be solved by first communicating all this knowledge to a central board which, after integrating all knowledge, issues its orders. We must solve it by some form of decentralization. But this answers only part of our problem. We need decentralization because only thus can we ensure that the knowledge of the particular circumstances of time and place will be promptly used" (1945, p. 524)

And "We must look at the price system as such a mechanism for communicating information if we want to understand its real function — (...) how little the individual participants need to know in order to be able to take the right action" (1945, p. 526–527) Decentralization refers to interpersonal, decentralized communication that leads to a better allocation of resources, or in other words, the market price mechanism. Although this explanation may not address all questions regarding the author's perspective on uncertainty, it fulfills the necessary scope for this article.

### 3.3 Davidson taxonomy

The taxonomy created by P. Davidson (1991) provides a useful framework for comparing different schools of thought in economics, both orthodox and heterodox. It is split into three types, as shown in Table 1, and helps to reveal implicit assumptions about the sources of uncertainty in these theories and their links to proposed solutions. Beginning with the separation of reality itself, if past events can serve as a scientific basis for predicting future events, then we have an example of an ergodic reality. Alternatively, if every event is unique and cannot be used for future prediction (not in the sense that it's a singular event and that's the reason why, but in a sense that this event can't be of some sort of class that could be scientifically analyzed), this is known as nonergodic reality. In ergodic reality, we can further divide the distribution of knowledge between individuals. If all individuals possess the same knowledge of possible events, then it is considered a risk (or Type 1). In addition to this scenario, there is a possibility that, despite the availability of all necessary knowledge for society, there may be barriers to obtaining and distributing this knowledge. There are several reasons why knowledge may be incomplete, including limitations in human cognitive abilities, incomplete data collection, asymmetry of information, and inadequate theoretical frameworks. This type of knowledge gap is known as epistemological uncertainty, or Type 2 uncertainty. In noner-

godic reality, also known as true, ontological, or objective uncertainty (as referred to by Davidson), we cannot base our predictions of future events on past events. In this scenario, the decisions made by individuals themselves create reality, and there is no cosmological plan for future events. Every event is unique, and even if there are similarities, they disappear over time and cannot be used as a basis for longer-term predictions. Another aspect of this taxonomy is transmutable/immutable reality, which is paired with nonergodic/ergodic reality. Transmutable means that individuals have the power to change the future (thus creating nonergodicity) versus immutable, where individuals cannot create the future (ergodic reality) (Bélyácz, I 2017). This also means that in ontological uncertainty, the source of uncertainty is in individuals' ability to create the future, whereas for epistemological uncertainty, sources are natural, non-human ones (in the sense that uncertainty is not created by human actions, and if it is, then this action is a more automatic one).

### 3.4 Modified taxonomy

To make this distinction even clearer, it is best to divide knowledge of society into three categories: individual knowledge, joint knowledge, and all-of-knowledge. The first category describes the knowledge owned by an individual. The second category can be understood as a mechanism for collecting individual knowledge and distributing it to other members of society. The last category is the sum of all the knowledge, both individually and jointly. In a situation of risk, individual knowledge is equal to all-of-knowledge, and there is no joint knowledge. This is because, in the long run, individuals are correct about their frequency predictions and do not require joint knowledge. Epistemological and ontological uncertainties are characterized by the existence of joint knowledge, but with different perspectives on the role of this joint knowledge. Ontological uncertainty is pervasive and can be detrimental to economic activity. Therefore, solutions to this uncertainty need

to be pervasive, unchanging, and certain (in some sense arbitrary) so that individuals can have faith in the constant nature of these solutions to engage in economic activity. However, such mechanisms are put and held arbitrary in place, making them harder to adapt to the people needs. Characteristic of the joint knowledge is centralization (unchanging and stable, hence need to be guaranteed by strong entities such as governments, but rigid in its rules). On the other hand, solutions to epistemological uncertainty are much less certain but provide more information, they can adapt easily to new needs, since they aren't restrained by arbitrary rules. For instance, the price mechanism is an example of joint knowledge. Joint knowledge of epistemological uncertainty can lead to optimal solutions, providing more information than ontological uncertainty. However, it is also less certain. For example, market failures are more common and significant than violations of ownership laws. Characteristic of the epistemological uncertainty is decentralization (lack of guarantee but isn't also constrained by its arbitrary backer rules).

## 4. Results

Both Davidson and the different side (Runde, Dow, Dequech, and Crocco) agree that institutions such as monetary contracts are the solution to uncertainty, thus placing these concepts in the ontological uncertainty category in the modified taxonomy. The only difference between the two lies in the degree of importance placed on uncertainty in each case. In cases of nonergodicity, uncertainty is the primary force shaping economic activity. For high levels of weights of arguments, uncertainty seems like a hindrance only in a few situations, mainly long-term predictions, but is not so important in most day-to-day economic situations. Hayek's perception of joint knowledge is not an empty shell; it is composed of 'spontaneous orders', or in other words, rules that have survived the evolutionary process. The most important of these is the price mechanism. The individual price mech-

anism provides a significant amount of information; it highlights the inefficiency of central planning, the inevitability of speculation due to the decentralized nature of information, and the importance of free trade for achieving better outcomes compared to central government planning. At the same time, these rules are not pervasive, as they can become obsolete at any point in their evolution. Even if society adopts such rules, it does not guarantee its survival. These characteristics are of epistemological uncertainty. These results are summarized in Table 2, showing the source of uncertainty, type of uncertainty, and solutions to uncertainty of each school in the scope of research. These results shed some light on the possibility of comparing different economist concepts of uncertainty, but the big gap in nuances can be concerning for this tool. Linking proposed solutions for uncertainty with assumptions about the nature of uncertainty instead of reverse linkage, like in the Davidson taxonomy, may create in the future a more robust way to compare different economists on their concept of uncertainty. More research is still needed to create more precise categories of solutions, as well as better understand the link between assumptions and these categories. The author of this article hopes that further research into different concepts of uncertainty will bring better understanding and thus probe this conception.

## 5. Conclusion

The Post Keynesian and Hayek offer fundamentally different approaches to understanding and managing uncertainty in the economy. The Post Keynesian approach relies on centralized solutions (e.g., government backed) and the creation of certainty through monetary contracts, while the Austrian (Hayek) approach emphasizes the importance of decentralized solutions, such as market processes and the evolution of rules to address uncertainty. The difference between Post Keynesians and Austrians lies in their assumptions about the source of uncertainty and the implications of these assumptions for the solutions

they recommend responding to uncertainty. Post Keynesians perceive the source of uncertainty as the ability of humans to freely create the future, while Austrians seek uncertainty stemming from external factors, namely, the decentralized nature of information.

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Appendix

**Table 1.**  
**Davidson taxonomy of uncertainty**

	Ergodic reality	Nonergodic reality
Type 1 (risk)	Type 2 (epistemological uncertainty)	Type 3 (true/ontological) uncertainty

Source: Davidson (1991).

**Table 2.**  
**Difference between PK and ASE on uncertainty**

Issue	Post Keynesian	Austrian
source of uncertainty	transmutability	decentralized nature of information (immutable)
type of uncertainty	ontological (type 3)	epistemological (type 2)
solution for uncertainty	centralized (e.g. government backed) like monetary contracts; ownerships law etc	decentralized, market based, like deregulation of market for speculation to resolve the issue

Source: Own preparation.