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A nuanced perspective on *episteme* and *techne* in finance

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ABSTRACT

The debates on the Black and Scholes model shed light on the distinction between practices (i.e. inductive know-how or *techne*) and theory (i.e. deductive know-why or *episteme*) in finance. We revisit the classical distinction, still accepted widely in the literature, between *episteme* and *techne* and develop a nuanced view by introducing two other levels of knowledge we will call "commanding knowledge" (*epitaktike*) and "practical wisdom" (*phronesis*). The major contribution of this paper is to use these four levels of knowledge (*episteme*, *epitaktike*, *techne* and *phronesis*) in order to highlight how this model subtly influenced financial practices by shaping the microstructure of the emerging Chicago Board Options Exchange (CBOE). Our analysis will then be completed by a *re*-interpretation of the existing literature about the performativity of the BSM model to show how these levels of knowledge combined each other in the evolution post-crash (1987) financial practices.

1. Introduction

The Black-Scholes-Merton framework is a cornerstone of contemporary finance. This model which is nowadays well-known either practitioners or theoreticians, also generates a lot of debates between critics and supporters of the Black and Scholes model: while Kalotay (1995), Derman and Taleb (2005) or Haug and Taleb (2008) called the Black and Scholes model (BSM) into question, other authors tried "to save" the model (Duffie, 1998; Wilmott, 2008) by replying that the model is "correct on average" (Wilmott, 2008, p.2). These debates shed light on the distinction between practices (i.e. inductive know-how or *techne*) and theory (i.e. deductive know-why or *episteme*) in finance - Haug and Taleb (2011), for example, emphasized this distinction by suggesting that financial practices are essentially concerned with *techne*. In this perspective, these authors explained the BSM (*episteme*) did not contribute to financial *techne* because it appeared as a mere theoretical formulation of well-known practices. More precisely, these authors claimed on the one hand, that the BSM does not present new reasoning but it simply models an existing (and well-known) argument in terms common with those of the economic mainstream (Haug & Taleb, 2011, p.97); and on the other hand, that traders do not use this model but rather sophisticated heuristics. Because financial products have been created several centuries ago while financial theory has emerged in the 1960s, this duality between practices and theory in finance is an old story (Poitras, 2000).

This paper shows that this distinction between *techne* and *episteme* is not so clear in finance especially for the case of the Black and Scholes model. The first section presents the major argument used for justifying the distinction between practices and theory. Following this, we will illustrate this idea with the argument developed by Haug and Taleb (2011) by nuancing that classical distinction between *techne* and *episteme*. More precisely, we will nuance this opposition between *episteme* and *techne* by introducing two other levels of knowledge that we will call "commanding knowledge" (*epitaktike*) and "practical wisdom" (*phronesis*). The second section will illustrate these different levels of knowledge in finance by providing a case study related to the Black and Scholes model. While the influence of the BSM on the direction and shape of modern financial literature is well documented in the literature (Merhling, 2005; Schinckus, 2008), its impact on financial practices is not so clear (or even denied, see Haug & Taleb, 2011). In this context, the major contribution of this paper is to use four levels of knowledge in order to highlight how this model subtly influenced financial practices by shaping the microstructure of the emerging Chicago Board Options Exchange (CBOE, 1998). Our analysis about these four kinds of knowledge (*episteme*, *epitaktike*, *techne* and *phronesis*) will then be completed by a re-interpretation of the existing literature about the performativity of the BSM model to show how these levels of knowledge combined each other in the evolution post-crash (1987) financial practices.

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2. Black and Scholes model as *techne*

Haug and Taleb (2011, p.98) explained that the Black-Scholes-Merton formula was a marketing argument promoting the economic establishment[1] of that time. These authors presented the BSM model as a way of formulating (*episteme*) a practice (craft) already used by the practitioners (craftsmen). Several historical examples are convincingly provided by explaining that *episteme* and *techne* must be clearly distinguished. Basically, the authors justified their argument by evoking a "broken chain"[2] between the transmission of knowledge developed by options traders and the academic knowledge:

> "For us practitioners, theories about practices should arise from practice or at least avoid conflict with it [...] Options hedging, pricing and trading are neither philosophy nor mathematics, but an extremely rich craft rich with heuristics with traders learning from traders [...] It is a *techne*, not *episteme*" Haug and Taleb (2011,p.97).

This distinction between *techne* and *episteme* can regularly be found in the literature (Poitras, 2000; Razgaitis, 2004; Houghton, Naastepad, & van Beers, 2015; La Berge, 2015) and it implicitly refers to the classical perspective of knowledge proposed by Artistotle in his discussion of prudence in the *Nicomachean Ethics*,

> "If science [*episteme*] involves demonstration, but there is2 no demonstration of anything whose principles admit of being otherwise (since every such thing itself admits of being otherwise); and if we cannot deliberate about things that are by necessity; it follows that prudence is not science nor yet craft knowledge [*techne*]. It is not science because what is achievable in action admits of being otherwise; and it is not a craft knowledge, because action and production belong to different kinds" (Book, VI, Chap.5 parag.3).

In other words, science is associated with things which can be demonstrated and deliberated before actions. In this perspective, *episteme* involves a reflexive knowledge implying a possible distinction between action and deliberation. We have an epistemic link between a deductive know-why and a post-deliberation action (idealistically, the latter should result from the first). At the opposite, craft (or *techne*) rather refers to practices where actions and productions are deeply embedded. Actions are not the result of a preliminary knowledge, they rather embody the production of knowledge leading to a broken epistemic chain between know-why and know-how.[3] In line with this Aristotelian dichotomy, Haug and Taleb (2011) explicitly associated BSM with a craft in which actions embody the production of a practical knowledge: the two levels of knowledge are therefore developed as illustrating in the following graph (Fig. 1),

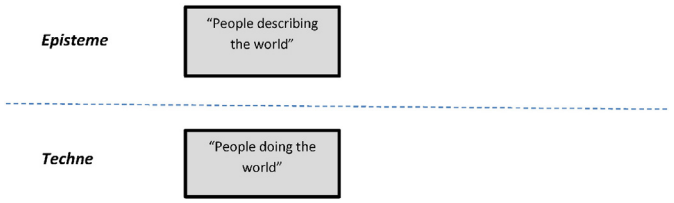

Fig. 1. *Episteme* and *Techne* are depicted as two distinctive levels of knowledge.

In this perspective, *Episteme* is generally associated with scientific knowledge in order to emphasize the certainty of its objects which do not change: scientific objects are supposed to be eternal and to exist by necessity. *Techne* rather concerns with the world of practices in the everyday contingencies. This is a well-known distinction used by Haug and Taleb (2011) as a justification for a distinction between heuristics used by traders (*techne*) and the option pricing theory developed in financial economics (*episteme*).

Although this distinction between *episteme* and *techne* makes sense, it is not so clear in epistemology.[4] In the Xenophon's Socratic dialogues, for example, *Episteme* and *techne* are interchangeable.[5] In *Protagoras*, Plato (1997) defined *episteme* as the role of reflective knowledge (i.e. way of illustrating discussions in philosophical conversations) while *techne* rather concerns with knowing how to do particular activities (piloting a ship, chariot-driving, carpenter, physicians etc) which indicates a theoretical component. This link between *techne* and *episteme* refers to the understanding (*gnosis*): the carpenter knows how to build a house because he knows how to use the right materials; the physician knows how to care for the sick because he recognized health through a specific *episteme*.[6] The only difference between these two levels of knowledge is just the context in which they are used: *Episteme* is a formulated knowledge about the world while *techne* is an applied (non-formulated) knowledge (craftsmen are not asked why they are doing their jobs).[7] In *Republic IV*, Plato nuanced this classical opposition between *episteme* and *techne* by introducing an intermediary level of knowledge: *epitaktike* which refers to "a commanding knowledge" (Parry, 2007, p.7). While the concept of *episteme* describes an abstract (mental) understanding of the world, *epitaktike* rather "gives commands whose effects are practical" (Parry, 2007, p.7). The best illustration of this sort of knowledge is architecture which is not a practical field since it does not directly produce anything in the way the carpentry does; however, architecture has direct and practical implications by shaping the work done by carpenters. Of course, *episteme* and *epitaktike* are interconnected since the former provides conceptual tools to the latter to define its structuring principles: architecture (*epitaktike*), for instance, uses a lot of mathematical notions (*episteme*) to define its commanding knowledge to the carpenter (*techne*).

[1] In the beginning of the 1970s, financial economics was at its origins and it was very important, for actors in this field, to emphasize its ability to provide scientific rigour to assertions and predictions regarding financial markets. The theoretical formulation proposed by the BSM model gave the opportunity to financial economics to establish its scientific authority (Bernstein, 1996).This model was, indeed, a marketing argument because it appears to be in line with the classical perception of knowledge evolution from unformulated knowledge (based on well-known practices) to formulated knowledge (based on theory). Philosophers of science usually deal with this kind of evolution between what they call proto-scientific and scientific knowledge. Basically, *proto-science* is often associated with a field based on a non-unified body of knowledge or founded on some practical evidences (Kuhn, 1970). In a sense, proto-science can be seen as a "practical wisdom" or "an object of perception dealing with the ultimate particular" (Jonsen and Toulmin, 1988) while science is rather based on conceptual knowledge providing general rules and basic principles unifying the description of a category of phenomena. For financial economists, the Black-Scholes-Merton model appeared to have the same epistemic properties than those usually associated with the development of a more scientific approach improving the understanding of pre-existing practices.

[2] "Options traders develop a chain of transmission of techne, like any professions. But the problem is that the chain is often broken as universities do not store the acquired skills by operators" (Haug and Taleb, 2011, p.98).

[3] In the Aristotle's quotation about prudence, prudence is not science neither craft because it refers to a no action which cannot be demonstrated neither associated with a specific production.

[4] Even for Aristotle himself since the distinction he proposed is not always observed elsewhere in his work. See Parry (2007) for further information about that point.

[5] The only difference emphasized by Xenophon is the way of learning: episteme is a knowledge acquired by teaching whereas techne is rather a knowledge acquired by training. However, Xenophon did not make distinction between theoretical instruction and learning by practice (Xenophon, 1979).

[6] A doctor cannot cure a patient's cough if he/she does not understand what a cough is.

[7] Nobody ask to a doctor why he/she is restoring someone's health since he is a doctor.