Writing the Future

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The future must be written, not predicted
The derivatives market is a technology for writing the future, not for predicting it.
THE MEDIUM OF CONTINGENCY

An Inverse View of the Market

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palgrave macmillan
Black Swan vs. Blank Swan

• The radically-emerging event is neither probable nor improbable
• It escapes the category of prevision altogether
• It is a case of *change of context*
Contexts or ranges of possibilities

- The case of incompatible observables in quantum mechanics
- The case of recalibration of derivative pricing models
- Bergson, Meillassoux
- Pierre Menard, author of the *Quichotte*
Objection: measure theory

• The *random outcome*, whether conceivable or not, is not measurable anyway
• Only its effect is, or the event to which it contributes: $\omega \in \{\text{S&P 500} = 0\}$
• The random outcome is only a *concrete random sample*
Concrete vs. abstract

• The category of point of view and abstraction
• Abstract probability theory only retains a certain *characteristic* of the random sample and cannot treat it in its absolute concreteness
• Continuity and infinity
Recalibration

• For the formalist, the *sample space* is only here (implicitly) to add new sources of randomness (stochastic volatility, jumps, ...)

• Is the derivatives market then an “absolute concrete” that is abstracted away by the representation of the price of the underlying asset as a random variable?
Recalibration

• “Possibly no aspect of derivatives trading has a deeper-reaching impact on pricing than the joint practices of out-of-model hedging and model recalibration.”

• “Similarly important, universal and difficult to justify theoretically is the practice of recalibrating a model to the current market plain-vanilla prices.”

Riccardo Rebonato
Towards a new formalism

• Probability theory not only needs to augment the *sample space* with an *event space*
• It needs to augment itself with *the whole derivatives market*
• The “total state” of the market is not a total of states
Abstract probability theory needs to re-establish contact with reality and with the massive randomness of the concrete world – only it will do so from the opposite end to the sample space.
Trading vs. states of the world
States of the world

• Abstract states of the world
• Derivatives are written in advance
• The market “selects” the martingale pricing measure and completes itself (!)
Trading

• The trading pit is the only concrete
• Distinction between contingent payoff and contingent claim (Harrison & Pliska, 1981)
• *Invention of writing* of the contingent claims: they are never redundant and the market is never complete
The market as writing

• A succession of writings, each one of which is a radical step outside the previous context
• Certainty of replication of the contingent payoff
• Event of writing of the contingent claim
Price surface vs. time series

• The formalism completes itself with the void that is outside the formalism
• The contingent claims are not redundant because they don’t exist
• Prices have never been identified with valuations and the price surface is an alternative exit to time
States of the world

Time 0

- \( W_{00} \)
- \( W_{01} \)
- \( W_{-11} \)
- \( W_{-21} \)

Time 1

- \( W_{11} \)
- \( W_{21} \)
- \( W_{-11} \)
- \( W_{-21} \)

Time 2

- \( W_{22} \)
- \( W_{12} \)
- \( W_{02} \)
- \( W_{-12} \)
Marks on paper

Contingent Claim

0

2 $\rightarrow$ Pay $f(2)$

1 $\rightarrow$ Pay $f(1)$

0 $\rightarrow$ Pay $f(0)$

-1 $\rightarrow$ Pay $f(-1)$

-2 $\rightarrow$ Pay $f(-2)$