



*From New York to London and Back Again* was the name of a group exhibition organized by Miguel Abreu and Urbanomic at Thomas Dane Gallery in London, 18 January–19 February 2011. The gallery also hosted an evening of talks and discussion the day after the opening (with Miguel Abreu, Elie Ayache, Robin Mackay, Reza Negarestani, and Matthew Poole) which was transcribed and published as *The Medium of Contingency* (Falmouth/London: Urbanomic/Ridinghouse, 2011).

This bulletin comprises economist and philosopher Elie Ayache's contribution to the event. Following Robin Mackay's general introduction and Reza Negarestani transmitted live from Iran, Ayache decided to ad lib rather than recite the paper he had meant to present, a neat embodiment of his subject. As in the book, both versions are included here, very slightly edited in order to plug a few bits and pieces of information lost in the funnel from one channel to another. With thanks to Robin Mackay, Katherine Pickard, and the author.

Ayache mentions two books in particular: Nassim Taleb's *The Black Swan: The Impact of the Highly Improbable* (New York: Random House, 2007), and his own *The Blank Swan: The End of Probability* (Chichester: Wiley, 2010).

Cover image: screenshot from a live market feed charting bids, asks, and trades (prices) over time

I traded options for ten years, on the floor, both here in London and in Paris, so I have some direct knowledge of the market itself as a material and as a medium, and not a theory. On the other hand, I am an engineer by training, so I know a lot about probability theory, and after being a trader for ten years, for the next ten years of my career I created a company that specializes in pricing derivatives. It is a software company, and what we develop in the company relies very much on probability theory and on the “metaphysical framework” whereby, in order to model the unpredictable, first of all you have to identify the different scenarios that may take place. And, according to all of us here, this is the major weakness of probability theory and of the metaphysical thinking of possibility when confronted by the pure contingent event: in order to model something and to project it in thought, you have first of all to give yourself the list of scenarios and then simply assign probabilities to them. That’s very easy when you are playing roulette or dice, because you know beforehand that the dice have six faces, so you know what the scenarios are; and in playing roulette, also in playing cards, you know what the scenarios are, so it’s very easy then to agree or disagree with one another, whether we should put a 50% chance on the coin or not, whether it’s wise or not — it becomes only a rather local and confined disagreement about what the probabilities are. But the main thing is that the scenarios are identified beforehand, and that’s the major weakness.

I studied probability theory, and every day my company develops software based on it — and I can assure you, it’s probability theory in its most sophisticated branches. We owe these sophisticated theories to finance; the mathematicians involved in probability theory and the like are all working in the field of finance, because it’s not probability like dice. You have to know a lot about stochastic calculus and other very advanced things, about volatility ... These terms are perhaps more familiar to us now(!) but basically, volatility relates to the fact that if you have something that is MOVING, you have the trend of the price — an upward or downward trend — from which volatility measures the standard deviation — the noise of the thing as it follows its trend. So, volatility is the measure of risk; and today, indeed, we have models in finance that deal with the volatility of volatility, and with jumps. I mean to say that it’s a very sophisticated field, and you have people who have PhDs, you have researchers, and you have papers and books on probability theory and quantitative models.

However, the philosophical foundations of this are very weak, because it hasn't changed at all. It relies on you beforehand having to model the possibilities. So the question is—and this is a question that Nassim Taleb, in his 2007 book *The Black Swan* has asked in a very good way—what if we are really dealing with a CONTINGENT event, a pure contingent event of such a kind that, beforehand, we don't know what it's going to look like? When we don't know from which roulette wheel or from which dice the outcome will be drawn—that is what a major event really is. And that's what Nassim Taleb calls a “black swan,” which he defines as an event that is very improbable. Now, of course it's improbable—but it's even worse than improbable. It wasn't even part of any list of scenarios that you had beforehand. So one of my criticisms of Nassim is to tell him that we shouldn't even call it improbable, because, if the event was not part of the pre-given list of possibilities, probability does not even apply to it.

Hence the subtitle of the book I wrote in response in 2010, *The Blank Swan: The End of Probability*. In the book I wonder what might take place beyond probability: maybe the most interesting things that we have to deal with are those that lie beyond probability, precisely in that area where probability has ended; maybe the event happens there. So, one of my questions is, what if we could frame that residuum, if you will, that dark region, where probability models stop? Maybe this region, in this blank residuum, is where we could connect with contingency, and where the meaning of contingency could be found. To anticipate, I must say that I have found the solution as far as my problem, in the market, is concerned. It is the market of contingent claims itself that provides me, as I will show you later, with that medium, or that line of communication, with the contingent event.

So, as I said, the contingent event really is something that happens out of nowhere, so you cannot model it, you cannot assign a probability to it by definition. The second feature that Nassim Taleb ascribes to this event is that it has a big impact, that it's going to affect our lives, the world, in some major way or another—because of course, even if the event is purely unpredictable, if it has no impact, who cares? It has to have a large impact, otherwise why mention it? So, to me, it seems more natural to define it by the impact, rather than in terms of probability. And by the

way, at the end of his book, Nassim also agrees that maybe probability is out of the question anyway. It's self-defeating, and it might be the impact of the event that would define it better than the probability you could have assigned to it beforehand. So, the impact is the major thing, and as examples of black swans, Nassim likes to draw on the field of business. He doesn't think of revolution, as Alain Badiou would, because Nassim is a capitalist, so he would rather mention things like Google, for instance, that weren't even conceivable a few months before they emerged; or even the phenomenon of an unexpected bestseller — he describes the success of *The Black Swan*, his own book, as a black swan. He didn't expect that he would sell two and a half million copies. So, he cites a few examples of events like that, that have deep impact. Of course, major events like wars are also black swans: world wars, for instance, are also black swans, and in fact Nassim Taleb is not the first one to have noticed that fact — to my mind Henri Bergson is the first philosopher to have identified the event as being something completely unforeseen.

And this brings me to the third characteristic of the black swan, according to Nassim Taleb — and to my eyes, it's the most important point, because I think it is here that I will find my entrance into that residuum that I need, in order to get to the event. Nassim says that the third characteristic is that the event CREATES its own causes — it's only after the event that you understand the causes of the event. He calls this the \*backward narrative.\* And this is true, because it's an event: beforehand, you have no idea what the event is like; it's only after it happens and after it has its impact, that everyone notices that it is an event. It's only afterwards, now that the event has occurred, that you can go back in time or in history and figure out the chain of reasons that will have led to it. And I think Bergson says something that is even stronger than this: he says that the event CREATES its own possibilities. The event creates the possibilities that have led to it. So, the third characteristic of the event is that only after the event can you then go back, rewind the picture, and list the possibilities that were missing before; and then say, well, I knew it — this was one of those possibilities, one that I identified only afterwards. And you may then assign probabilities to it. It is only after the event that you can think of the model of the event — which is too late anyway.

By the way, Badiou, in *Being and Event*, which was published 20 years

before *The Black Swan*, does exactly the same thing. Faced with contingent events, Badiou's solution, like Nassim's after him, is to say that the event is not part of any identified situation when it occurs—it's not part of any set, whereby you might identify the possibilities that the event will actualize. So, according to Badiou, the event doesn't exist, because to exist is to be part of a set, according to mathematical definitions. So, Badiou has a way of defining the real feature of the event by saying the event is a member of itself, so it creates its own possibilities. Then, you recognize that it was a member of that set, so the event is the set that is a member of itself, if you want to be logical. And when he says that, Badiou is in contradiction with the Axiom of Foundation of set theory, so therefore he has to develop a whole new non-standard logic, etc. Reza Negarestani talked about a twist—we feel that something has to be twisted, in order to let the event in. Maybe you have to twist time, in a way.

As I said, I'm interested in identifying the residuum above probability or below probability through which I could connect with the event, which in my book I call the "medium of contingency," and which is the market, in my case. However, I have found during my research other media, other channels that connect you to stuff outside probability and possibility, and one of them is actually very funny. It's almost trivial. Or rather, it's non-trivial, but it needs some thinking about to understand what the example is.

"Pierre Menard, Author of the Quixote" is a very short story by Borges, where he tells the story of the life of a French writer called Pierre Menard, in the early 20th century, who has spent the last 20 years of his life writing two chapters of Cervantes' *Don Quixote*, writing them word by word. It's weird, because you tend to think, well, you're just copying them ... But no, if you read Borges' story, you can trust Borges to convince you that, actually, Pierre Menard has done something original. When you read the story, you are actually convinced that he is producing an original work, the work of a creator, even, of an artist—yet he knows what he is doing. It's not even that he didn't know that Cervantes had already written *Don Quixote*—he knew that. He wanted, on purpose, to write *Don Quixote*. So, he is creating, he's producing something new, something contingent, let's say, something that could have been otherwise. After

all, there is no creation if you're just copying *Don Quixote*. Yet the set of possibilities is limited to only one, because he knows beforehand that he is going to actually write *Don Quixote*. So, my question is, where do you place the creativity of Pierre Menard?

To my mind, it lies in that blank residuum that I'm pursuing; and that must be beyond possibilities, because in the space of possibilities, Pierre Menard is doing nothing. He is doing totally zero, because in the space of possibilities the work exists, it's *Don Quixote*, and he's just copying it. If you believe in the metaphysics of possibility and probability, where everything is framed in identified states of the world, and so on, then Pierre Menard is doing nothing, totally nothing. Yet by reading Borges, you are really led to believe it possible that Pierre Menard has done something original; and the key thing to me is that what Pierre Menard has done is to WRITE two chapters. He didn't read them, he didn't just think of them. So, he really NEEDED the MATERIAL MEDIUM, the writing itself, in order to produce something that, when you read it, you say, well, although it's the same—it has the same identity as Cervantes' novel—it is materially a new work. And although my main object is the markets and finance, although that's important, and I identify the medium of contingency as the market in my specific case, in the end its generalization is also writing.

I also happen to be a writer, so I also speak for myself: writing, to me, is something that is beyond probability and “states of the world.” It's something where the writer can really throw himself into a process of writing, blindly so to speak—and one of my favorite expressions is that he is then \*traversed by contingency,\* so he almost surprises himself with what he is writing. To me, that's writing: even though you may have thought about it, and you had planned it, there are thoughts that you can only have through writing. I'm sure everyone has found that: there is no use really in planning in advance what you are going to write. Even if you do that, chances are that you'll end up writing something different. I think that the true spark of writing comes when you find yourself surprised by what you have written; and I would even claim that there are thoughts that you can only have through the material process of writing.

So, writing to me is an attempt to try to get to that extraordinary or residual thing that surpasses probability and the states of the usual

metaphysical conception; and which would allow us to TWIST chronology in such a way that, even though the event happens and it is only after the event that we can think it, somehow we establish communication with it outside time. Remember, I need to twist time itself in order to be able to predict the event “beforehand,” even though it has happened.

It so happens that I found this also in the writing of another thinker, Pierre Bayard. He wrote a very popular book that has been translated in many languages, *Comment parler des livres que l'on n'a pas lus?* (How to Talk about Books You Haven't Read). One of his previous books is *Demain est écrit* (Tomorrow is Written), and in that book and also in one of his latest books, called *Le Plagiat par anticipation* (Plagiarizing by Anticipation) he develops, to my mind really very seriously, I mean metaphysically, the theory that, if you forget about probability and about the way that the scientist thinks about things, and if you immerse yourself in writing, the medium of writing, then it may turn out that some writers have actually predicted in writing what would happen later, and that some works that were written chronologically before other works, have actually copied them. And Bayard gives very precise cases, because he's a literary critic, cases where very well-known writers of the 18th and 19th centuries have actually copied works by writers who came later. So, this also struck me as something where we are discovering this medium of writing, which may be a way of cheating chronology and of being inventive and original in our writing, contrary to what the metaphysics of possibility dictate to us.

Which finally brings me (and here I will be very brief) to my very mundane subject, which is the market of contingent claims. So, what is the solution as far as my problem is concerned? It's amazing that finance is so important today, and the theories of finance are so sophisticated, in terms of probability theory, but no one, believe me, no one in those theories has yet questioned this thing that I'm going to tell you here.

In short, the derivatives MARKET is not part of derivative pricing theory. If you open any book on derivatives pricing theory — and there are loads of them — what they will all tell you, begins with the traditional metaphysical thing — states of the world, probabilities, etc. — and at the end of the book or the end of the chapter, it will tell you: therefore, this is how you would compute the theoretical value of the derivative. So, you



end up by saying, given all my scenarios, and the probabilities that I have assigned to them, this is what the value of the derivative should be—BY NECESSITY, because it's a mathematical proof.

But then, if it is this by necessity, WHAT'S THE USE OF ACTUALLY TRADING IT IN THE MARKET? You see how this reasoning is self-defeating: because, if you trade it in the market, that means you have to trade it at a variance to the theoretical value. If everybody knew, given the scenarios, what the theoretical value would be, why trade them? If you trade them, then it means precisely that pricing is not in the least what those books tell you it is.

But not one of them even mentions the real market. I challenge you to open any derivatives theory book: you won't see the market. Now, if the market precisely happens AFTER the book is closed and done with—you have the value and then the trading that usually takes the value and trades it at variance with the theoretical value—then it's the market that is the interesting part, and that happens beyond probability. And I develop this at length in the book, and discuss the trader who is really used to the market, and how he uses the tools of probability. Because I'm not dismissing them, the theoretical tools are used—but you have to think like Pierre Menard, I'm telling you: Pierre Menard is using Cervantes' *Don Quixote*. He used it as a probabilistic tool (except it was not even a probability, but a necessity for him), and he produced his work beyond it. Likewise, in the market, my conclusion is that the derivatives trader needs the probabilistic models, even the most sophisticated ones, precisely because he needs to go beyond them, in that medium which is the market, and which otherwise, if he were to stop at fair value or theoretical value, would not even exist. Therefore, the market is precisely what opens beyond probability, and I argue that, if you put yourself in the shoes of a trader, like I used to be on the floor, trading those derivatives, you will find yourself connected with contingency and outside time, outside chronology, outside probability, directly in the middle of the event.

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Ayache's talk departed significantly from the written paper he had planned to read, which now follows:

## IN THE MIDDLE OF THE EVENT

In *The Black Swan*, Nassim Taleb tries to understand our thinking and rationalization in relation to highly improbable events. One way to explain what I do in *The Black Swan* is that I discover a link between this problem and the problem of recalibration in the trading of financial derivatives.

Anyone who trades in derivatives is reliant on a “pricing model” that they use to estimate the fair value of derivatives relative to the known value of some more basic stuff. This is a model of how the market in secondary derivatives of traded commodities works, in relation to those primary commodities and to the current state of the market.

Now, all derivatives traders regularly recalibrate their pricing models according to changes in the derivatives market itself. One of the most regularly employed concepts, that of “implied volatility,” even reads off the volatility of the underlying commodity from the derivative price.

But despite this, recalibration of the derivative pricing model is a heresy from the point of view of academia, of academic accounts of trading. As opposed to the actual practice of trading, derivative valuation THEORY deals only with probability and stochastic processes and stochastic control and knows nothing of market price or implied volatility. These valuation theories have hitherto proceeded on the theoretical assumption of a stochastic process, and have disregarded the effect of the recalibrations of the market on itself. Trading derivatives in the market is precisely pricing them at a variance with the value that theory prescribes for them. (Otherwise, why trade them?) The market price becomes the input of the pricing model instead of an output. This is what recalibration is all about.

The whole purpose of my book might be summarized as trying to find out what a derivative pricing theory, or at least, technology, could be, which took account of THE REALITY of the derivatives market. The market itself would be an integral part of such a theory, rather than being considered as the exception or the accident that always ruins the probabilistic model!

So, you can see that this question bears a special relation to the concept

of contingency: the academic theoretical models try to model the market as if it was an already-written reality that implied a certain range of future possibilities; whereas recalibration means that, even as they use these models, traders \*rewrite\* the market continually in contingent ways that these models cannot capture.

So, my observation is that both problems — the black swan and recalibration — are criticisms of the notion of identifiable states of the world and consequently of possibility. And then my bold speculative thesis is that these two criticisms of possibility ARE IN FACT ONE AND THE SAME. If, following Bergson, we call the criticism of possibility and its metaphysics A RETURN TO THE REAL, then my thesis can be rephrased as follows: \*the reality of the true contingent event is the same as the reality of the market.\* They are made of the same fabric.

The true contingent event escapes the category of possibility because it is truly unpredictable and cannot even be identified as a possibility before it is realized. For this reason, \*the event is real and not possible.\* It is real to the extent that it is opposed to possibility. Contrary to what the metaphysics of possibility provides, the real precedes the possible and the true contingent event \*creates the possibilities that will have led to it\* (what Taleb calls the “backward narrative”). But is this reason to believe that the event is real (instead of being possible) BEFORE it actually occurs? It may sound amazing that a future contingent event should be thought to be real before it becomes actual. Yet this is exactly the transformation of metaphysics that I am aiming at. A thing can be real without yet being actual; this is what Bergson and, later, French philosopher Deleuze call the virtual.

Some would argue that the unavailability of the true contingent event as a prior possibility, or in other words, its opposition with possibility, is no reason to think it is real. Perhaps it is just NOTHING before it actually occurs. What is this ghostly reality of the event prior to its occurrence anyway? How could the event even be identified beforehand for us to speak of ITS reality (or possibility, as a matter of fact)? The contingent event emerges purely out of the void. There is no range of possibilities preceding it, and it truly creates its own possibilities, or the very set of which it will be a member. This may sound even more amazing, and it

took someone like Alain Badiou (who wrote about all this 20 years before Taleb) nothing short of a reformulation of set theory in order to frame the event and its peculiar ontology (which is, by the way, that no ontology accepts the event — that they all reject it). In his presentation of Badiou's philosophy, Peter Hallward writes:

**Where exactly lies the ontological peculiarity of the event? Unlike all normally structured or well-founded multiples, an event belongs to no already existent set. Insofar as it "exists" at all — and remember that to exist means to belong to a set — the event simply belongs to itself. It is, as an occurrence, self-founding, which is to say that it is properly unfounded. [...] In set-theoretic terms, an event is exceptional because it does not comply with the axiom of foundation, that is, the axiom proposed (by Zermelo in 1906) precisely in order to block the paradoxical possibility of sets belonging to themselves. Because it violates the axiom of foundation, "the event is forbidden; ontology rejects it." (Badiou, *L'Être et l'Événement*)**

Badiou is a philosopher of the cut and of discontinuity. By contrast, there are other philosophers, like Bergson and Deleuze, who are "continuists." Deleuze cannot accept that something that is not real may suddenly jump into reality. Perhaps what appears to be a discontinuity is only relative to the point of view. Who said the only way to look at an event, before it actually occurs, should be to look at it through chronological time? Why should prediction and identification be the only way to deal with the event? The event is actualized all right; however, what actualizes it should be the real, not the possible. Possibility is only the way to think of the event conceptually. This is why it is derivative and always comes second. It allows us to speak of the event objectively, to measure its probability etc. But it cannot itself produce or generate the event. What we need is the genetic condition of the reality of the event, not the condition of the possibility of its knowledge.

Probability is always contextual, mind you. It does not make sense to ask for the probability of a single case event, absolutely. The event has first to be identified as a member of a well-defined range of possibilities. For instance, you cannot theoretically value a derivative unless you specify whether your states of the world are going to be states of the underlying,

or states of the underlying with states of stochastic volatility added to them, etc. This is because your valuation theory requires probability and well-defined ranges of possibilities. Yet the market manages to value, or rather to price, the contingent claim absolutely. As a matter of fact, the problem of recalibration, which is definitional of the market, is just the rediscovery of the incompatibility between the market's "pricing method" and probability theory. The hint, here, is that if we manage to reorient our perspective in such a way as to no longer perceive Badiou's void before the event — if, that is, we manage to deal with the future event somehow outside time — then it may turn out that the market is what replaces that void.

So, to go back to the future contingent (and unidentified) event and to see how it can be real without being actual, let us start from the reality nobody puts in question, let us start from the real and actual event, from the real and present world, and let us first reason that we call it real (obviously) insomuch as it is no longer possible. Even the actual event should ultimately, absolutely escape the category of possibility. We think it is no longer possible because it is actualized and has exhausted the possibilities. But what if the reason it is not possible was not that its reality HAS NOW SUCCEEDED to its prior possibility, but that its reality is absolutely and timelessly OPPOSED to possibility? What if it never was a possibility, exactly like the future contingent event? This is the same contingent event we are talking about, after all. Why should its relation to possibility change as it moves, by the passage of time, from being future to becoming present and actualized?

The void of possibilities that we were facing before the emergence of the pure contingent event should be maintained after it becomes actual. However, we find it difficult, now that the event is real and actual, not to think that its contingency is in fact due to its being a member of a list of alternative possibilities, one of which has been realized. It was easy to think that there was nothing — only the void — before the occurrence of the purely contingent, purely emergent event, but now that the real, actual (yet contingent) world is there, together with the event that has brought it about, we can't help thinking that there exist variations of it out there — what we call alternative possible worlds — that explain its contingency.

This thought must be resisted. We have to suppress possibility in our thinking of the contingency of the actual world in exactly the same way as we did in our thinking of the future contingent world. We have to recognize the actual world to be contingent without identifying alternative possible worlds that are supposed to have made it so. Those possible worlds are only a fiction. We should recognize the contingency of the actual world through the one and only reality of its contingency, not the unreality (or fiction) of its possible variations.

This is just saying that the present actual world, which — as we all agree — is every bit as contingent as the future world, actually does not dwell in a well-identified state, either. Sure enough, it is present and it is actual. But with what authority do we partition it into recognizable events and states of affairs, and decide what is an event and what is not? Once you radically drop the identification of states (either actual or possible), time becomes incidental, really. There should really be no difference between the present world and the future world, except the incidental fact that the one succeeds to the other in time. In terms of what truly matters here, namely contingency, the present world and the future world are equal. This also means they are equal in terms of reality, which is the other side of contingency (as contingency is the only thing that is real). “Succession is not an illusion; it is only that succession is the shallowest thing,” writes French philosopher François Zourabichvili.

The future event is real; it is here alright; yet it does not exist yet. It is only the course of time that will make it exist and will actualize it. But time is incidental to the event — time is not the only way we should relate to the future event. What if the future contingent event had a PLACE instead of a time or a timing, a place we could inhabit independently of time? What if the identification of the event — which can only happen in (due) time — were not what truly mattered in the event? What if the actuality of the event were only one side of its reality — an accidental side, that is, which only depends on accidental time — and the more essential aspect, or trait, or stroke, or characteristic of the reality of the event were its bare contingency? What if we managed to relate to its essential trait and contingency without relating to IT as an identified occurrence? Since we relate to its trait outside time, through this special medium of contingency that remains to be discovered, and no longer necessarily

relate to it as an identified occurrence, can we still be said to predict it? Is it even important to PREDICT it? Perhaps a more essential relation can be established with it — a “work relation” instead of a “state relation.” That we should work our way through that special medium of contingency instead of expecting or predicting the event in time may be the best way to deal with the event and to “predict” it somehow.

It may be wrong to expect the true contingent event in time or in possibility. It may even be wrong to expect it at all because it is truly unpredictable and unexpected. In Badiou, we seem fascinated by the fact that the event emerges out of nothing and we wonder how this is possible. We place ourselves in time, before the event, and we wonder what could have preceded the event, in time, so to announce it. I say forget about time. Go from the reality of the contingent world that will be actualized in the future and step back to the present spot \*while remaining caught in reality\* (that is, while avoiding stepping into the tree of possibility). This sounds impossible, literally, because we seem unable to step back in time without awakening possibility.

But I say THE MARKET is the incredible medium in which this movement between present and future IN REALITY can take place. The market, where the price of the contingent claim is expressed, does not take place before the event of the triggering of the payoff; it takes place in place of the event; it truly replaces it. The reason why there is no event “yet” when you stand in the market, is not that the event has yet to come, but it is that the market replaces it; it is its other face.

Let us not forget that the reality of the market is also defined “negatively” relative to possibility. Pricing is incompatible with identifiable ranges of possibilities because of recalibration. It is not the case that recalibration is a temporal process that keeps shifting the ranges of possibilities over time. It only looks that way because the market lives accidentally, yet unavoidably, in time, like us all. In fact, the range of possibilities is never settled; it is as if, every time we tried to fix it in thought, the idea that a certain contingent claim of nth degree of complexity would turn out to be redundant by virtue of the (perhaps composite) dynamic replication strategy that we would deploy within that range of possibilities. It is as if this idea forced us to withdraw that range further back in our mind and to think that the “true”

range would have to be more encompassing.

In order to derive their famous equation that allows us to price an option, the economists Black, Scholes, and Merton begin with  $V(S,t)$ , the price of a derivative as a function of time and stock price. They assume that the value of the derivative is dependent only on two variables,  $S$  and  $t$ —the price of the underlying stock and the time until expiry of the option. And they had to assume that the value was given before they derived it. But what is this “value”  $V(S,t)$  they are positing? Is it not supposed to be the market price of the derivative? And if so, would it not have to depend on the volatility of the underlying price process itself as an additional stochastic variable? And why should the derivative price not also depend on the volatility of volatility, etc? Reasoning this way, we find that the formula would have to include an infinite number of variables—the volatility of volatility, the volatility of volatility of volatility, and so on—before we could begin to derive anything from it.

Now here is my bold speculative thesis concerning the relation between the market and the heart of the contingent event. This infinite unsettlement (at any level) of the range of possibilities in which possibly to frame the present price of a contingent claim is just the reflection, ahead of time, of the unsettlement of the range of possibilities concerning the undivided, undelimited and unidentifiable contingency of the final trait of contingency of the final contingent world. Through the price, we relate to the future contingent event without the intermediation of possible states and probability, and the same criticism of possibility applies on BOTH sides of the event.

Now, the key observation is that whereas absolute contingency was the thing that disrupted the identification of possible states in the final contingent world (that is, the fact that the world was massively contingent without a distinction of possible variations of it), what disrupts the identification of states in the present market is the postulate of the EXCHANGE (or the fact that no contingent claim, no matter its level of complexity, should be redundant and should always be exchanged).

My thesis is that these two things are the same. Absolute contingency of the final world gets reflected or translated, ahead of time, by the



exchange. The market, or the exchange, is how absolute contingency projects itself ahead of time. This may even act as a definition of the exchange.

In a way, the price is already in the middle of the event; it is every bit as real as the future contingent event will be real when it is actualized, only it is translated (literally dragged in space) to a place that occurs “prior” to the event. To be more accurate, I should say that the price is every bit as real as the future event IS already. As a matter of fact, the price, or the market, is the virtual we are talking about, or the reality of the event that “precedes” its actuality. Therefore, to be in the market and to trade contingent claims via a pricing tool that precisely acknowledges recalibration is to be in the middle of the contingent event. This is better than predicting it.

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