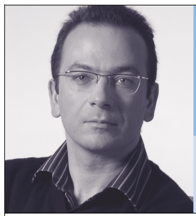

Nail in the Coffin

I Am a French Speculator!*

The capacity of writing provides the missing link between the Kerviel case and the credit meltdown argues **Elie Ayache**

Written Causality vs. Physical Causality

That the Kerviel case should appear in the press in the wake of the publication – of almost unfailing regularity since the summer – of the massive subprime write-downs that the largest investments have taken one after the other, this, in itself, should be reason enough to try and look for a connection between the two seemingly unconnected events. We shouldn't expect the link to be found in causality, which is insignificant anyway given the magnitude of the losses, but probably in the logic of *escalation* of the losses: in the dark side, the "down side," of the credit write-downs, not to say, the abyss of their meaning.

Simply, the credit crisis has made the recording (in this case, in the newspaper) of such record-breaking losses *possible*. It is as if it was telling us that banks were now *capable of* losing (writing down) such amounts. In front of this *capacity*, which is only that of writing and which has nothing to do, as such, with physical possibility, it becomes irrelevant to go looking for the real underlying cause, the day the next massive loss is published. It is not as though the credit crisis had slackened the banks' immune defense systems (for example, their risk control procedures) or driven their traders to madness, thus preparing them for the Kerviel-event. The credit crisis has simply prepared *history* for such an event. It is history that will be written with such figures from now on; in front of this written fatality, any physical explanation will always look too superficial.

I do appreciate the extent to which this strange causality, which seems to occur within the logic of writing and not in the physical world, may seem fantastical and improbable. However, what gives it credence to my eyes is the fact that astronomical amounts, such as Kerviel has lost, are beginning to surface *only today* on such vanilla markets as the one he was engaged in. Considering how long these markets have existed, and if the causality had only been physical, traders a hundred times more ordinary than Kerviel or a hundred times more adventurous would have had countless opportunities already to do what he has done and to lose what he has lost. The less a link exists between the credit market and the market on which Kerviel operated (that of stock index futures), the more pertinent will be my explanation by the capacity of writing rather than by physical probability!

Understand me well. By revealing this new type of causality, I am not yielding to fantasy or to metaphysical speculation. To the contrary, I am being a conservative and my primary objective is to avoid strange mixtures. Indeed, chances are we will be awash with explanations alluding to "crazy finance" (unbridled speculation and the lack of realism and utter artificiality of the derivatives) as the one and only common cause of the credit crisis and the Kerviel-event.

* Quote from the movie *Le Sucre* (1978), directed by Jacques Rouffio, starring Gérard Depardieu and Jean Carmet.

If banks, markets, and derivatives had never existed, then obviously the Kerviel-event would have never taken place. The causality that I am seeking out, however, purports to be a thread, or maybe just a narrative, running inside this rather expeditious alternative. We must look at things from the *inside*, and the way I see things is that three successive periods can be singled out for derivatives: periods to which correspond three different relations to writing.

Events that have had, historically, deep enough an impact on derivatives markets to deserve the name of "event," and if they have, ironically, almost always resulted in spectacular routs, should therefore be read in the light of the transformation of writing and not of the physical world. It is on the writing plane that the logic of succession of events shall be found, and it is this logic that will reveal the Kerviel-event as the last and most extravagant avatar.

Dynamic replication and derivative trading

The first period is that of classical derivatives that can be replicated dynamically by their underlying. This is a period where writing has reigned supreme and was able to constitute, through derivatives market, far better than a prediction tool: a tool for the *prescription*, or again, the writing, of history and contingency.

First-period derivatives admit of a tradable underlying. As such, they are mathematical conditions written on their underlying: a list of scriptures instructing the derivative seller to pay a certain sum to the buyer, on a fixed expiration date, if certain mathematical conditions are met by the underlying. The seller is deemed to have *written* the derivative, for he has issued a promise; he has committed himself in writing; he has signed and sealed a sort of testament to be opened only on the expiration date, which will distribute the fortune differently, according to what was written for the various "states of the world."

As early as 1973, Black, Scholes, and Merton showed that, in order to honor the future contingent claims of the buyer, the seller only needed to invest the premium he has received upon writing the derivative in a dynamic buy-and-sell strategy involving the underlying. The buy-and-sell program would progress until expiration of the derivative to the point of duplicating its payoff exactly, following a readjustment rule that depends only on time and the price of the underlying. The Black-Scholes-Merton mathematical model describes this dynamic replication algorithm. It provides that the replication cost will vary with the volatility of the underlying price. In order to break even, the seller should ideally ask, as initial derivative price, the sum of money that the dynamic replication will cost him. Thus the Black-Scholes-Merton replication algorithm was long used as a derivative pricing tool. The crucial parameter is the volatility of the underlying and the *sine qua non* condition is the ability to trade the underlying continuously.

To the hermetical, solemn, and sealed writing of the derivative payoff, the final sentence of which contingency alone was supposed to reveal, the replication algorithm has thus substituted a tight and minute writing, a continuous writing that the patient trader will have to pursue as he buys and sells the underlying. The price to pay is a persistent *slippage*, all the larger that volatility is larger, as if the trader had to follow the thread of history as closely as he can, trying to duplicate its characters as best as he can, without ever totally succeeding in catching up with it. Thus the premium collected at the start progressively declines; however, the trader has no problem with that as it is just what the algorithm provides.

What the Black-Scholes-Merton theory did not provide for, however, and could, for this reason, only be *written by history*, is that the trader who finds himself caught in the middle of the underlying market, trying to trade the dynamic replication of the derivative, automatically *finds himself* in a position to trade the derivative itself. And this is exactly what he is meant to do, as the mere replication job could largely be carried out by an automaton.

The Black-Scholes-Merton formula tells the trader how to value the derivative based on the price of its underlying; but it remains absolutely silent when it comes to trading the derivative in its own market, following its own supply and demand. Not to say that the traded derivative has become a substitute for the underlying; for we are speaking here of the extra negotiation margin, of the market that will belong to the derivative after the Black-Scholes-Merton formula will have chained the derivative value to the underlying. This specific market can only have as purpose "speculation" on volatility (I prefer to use the word *trading*).

As volatility is the only free parameter of the Black-Scholes-Merton formula, contingent variations of the derivative price – *and by this I shall mean, from now on, those variations that are not provided for by the formula but emanate only from the supply and demand specific to the derivative* – can only reflect now anticipations of volatility.

Thus, what falls under the category of the *possible* and the predictable and is all readily mapped out as possible values of the underlying, in a word, that which is already represented as a well-ordered and developed vision of the future, this is readily covered by the formula and by dynamic replication. For this, nobody needs a trader.

However, what now falls under the category of *contingency* – and this now means the unpredictable revision of the whole field of possibility, the re-indexation of the predictable, in other words, the sudden shift of the prediction model, or indeed the shift of the whole vision of the future – this contingency which is true external contingency and which cannot be reinternalized for the reason that this would bring about a new *prediction model*; this real and unsurpassable contingency *which is called history* must now be covered by the derivative trader, who is there for this reason.

The history-writing machine

Now we can see what formidable machine for prescribing and processing history derivatives markets in fact are! Indeed the contingency that must absolutely be treated and processed, the truly interesting contingency, is precisely the one that shakes and unsettles the range of possibility and for this reason forever evades any attempt to circumscribe it by possibility. Every theoretical prediction model exhausts itself in the range of possibility, thus turning contingency into the thing that will exceed it by definition. Now, dynamic replication achieves just that. It covers and exhausts the whole range of possibilities, replicating the derivative payoff in each and every state of the world. And so the derivative trader needs to worry about possibility no longer: he can free himself completely to the external space where serious contingency properly takes place.

The Black-Scholes-Merton model assumed that volatility was constant and that the paths of the underlying were continuous. Came the October 1987 crash and it played precisely the role of the contingency that would be severely critical of this fine theoretical representation. Volatility was suddenly able to explode and the underlying to jump downwards by 30 percent!

The Black-Scholes-Merton model left no room for the derivative-specific market. It is the 1987 crash that marked the true beginning of that market! It made the notion of *implied volatility* universal, which is just a way of saying that the derivative-specific market, this immediate register of history, would from now on be the one in charge of supplying the volatility number to use in the derivative trading protocol, and not some ad hoc forecasting or econometric procedure whose prediction can only be metaphysical. With the advent of implied volatility, the writing of history could now penetrate the writing of derivatives in return.

However, the "main virtue" of the 1987 crash was that it was still written in terms of the underlying. The event mainly concerned the prices of underlying stocks, and the derivative instruments, which are nothing but written overlays on these underlyings, subsequently coincided with history, *which is what is written because it is what cannot be predicted.*

As for the subprime credit crisis, it is an altogether different story because here we have no underlying, no dynamic replication, and no implied volatility.

Unreplicable derivatives and the subprime crisis

Thus the second period that I single out is that of credit risk securitization products, typically CDOs (*Collateralized Debt Obligations*), and more generally, what we call "correlation products." Credits of several entities (for example, a hundred) subject to default risk are bundled in a single investment vehicle, which is then marketed in different tranches with different risk-return ratios. The lowest tranche yields the highest interest payout, but will suffer alone the shock of the entities that will be first to default (for example, the first ten). The next tranche yields a lower return, and is only threatened by the following tumbrel of defaulting entities. So on and so forth.

To value the CDO, i.e., to calculate the coupon amount that the investor is entitled to claim, we must calculate the default probability of each tranche, i.e., the probability that the first tumbrel of entities will be decapitated, then the second tumbrel, etc. From this we discover that default *correlation* is the crucial parameter, also called "default contagion." Imagine, indeed, that you are the holder of the lowest tranche of a CDO that includes a certain number of banking establishments among its constituent entities. Your biggest risk is that those banks should start defaulting in concert, following, for instance, a severe financial crisis affecting the whole banking sector!

Now, I declare that the CDO *is not a derivative instrument*, but an absolute instrument, or rather, a dogmatic instrument. To me, a derivative is any written product whose underlying, itself tradable, already covers the range of possibilities, and whose specific trading, which occurs *after* the underlying has covered all the possibilities and achieved the virtual replication of the derivative (where derivative valuation theory meets its end), amounts to treating *what's next*, i.e., the nontheoretical *excess*, i.e., the contingent, innovative, totally unaccounted for, shift of the whole range of possibilities. Derivative trading does not take place in possibility, but in its beyond, what I call *capacity*.

The CDO has the disadvantage that the only possibilities that are covered by a tradable underlying are the individual defaults of the constituent entities, and not the joint defaults. In fact, the market already "publishes" credit default swaps (CDS) as written material that can be used to duplicate and attain the individual default events; but states of the world of joint defaults, which are crucial for the CDO, are not "put to market" in a ready way which would play the role of underlying for the CDO or of calibration reference; the first time they are put to market is via the CDO itself!

The beneficial sequencing of *possibility-replication-contingency* is, therefore, not available for the CDO. The CDO trader sees no separation between the range of possibilities, which falls within the jurisdiction of the theoretical model, and the external contingency that extends beyond the model. While the trader has no reason for being-here *other than* to exceed the theoretical model, he will not be able to do so and to address contingency *per se* this time round, because possibility will not have been saturated by dynamic replication. Since dynamic replication is the condition that inserts the trader in the market and in history, and since there is no such thing as the dynamic replication of CDOs, it is not at all sure that there *exists* such a person as the CDO trader. The CDO is valued based on a theoretical hypothesis concerning the possibility of defaults and their correlation and it is directly delivered to the market, without the intermediary of a trader who would be capable of criticizing the model and would dedicate himself to the "processing" of contingency. To have this capability, it is indeed necessary to set a firm foot on the ground of possibilities, and it is necessary that this ground be covered, to that purpose, by dynamic replication.

The product is delivered to the market with no other ground to support it than dogmatic faith in the perpetuity of the market itself. But it suffices that the theoretical model is doubted, or that we realize that there exists no objective measure for default correlation (not to mention that defaults are, by definition, events that have never occurred before; therefore, they lack statistical measure), for the whole edifice to come tumbling down! The market just vanishes, taking with it the whole valuation dogma! This is just what happened.

CDO traders believed in their market like in some absolute and necessary being. Yet there is no absolute but *absolute contingency*.[1] Contingency could then only strike them in the total and utmost manner which consisted in making their market disappear. By contrast, the contingency that is specific to replicable derivatives is modulated. When it hits their theoretical valuation model (the 1987 crash), the only consequence is that the model overturns. As for the trader, he persists in the market because dynamic replication, which first implicated him in the market, persists.

The outcome of the 1987 crash was the appearance of the *volatility smile*: each derivative was to be henceforth valued with a volatility number different from that of another derivative written on the same underlying. The model overturned. The derivative market price was to dictate volatility now, not the opposite. But what must be remembered is that *this inversion could not have happened if dynamic replication and the implicated trader had not remained rooted to the spot of the market, thus playing the role of pivot point for the inversion*. Contingency is indeed absolute, but the implicated trader remained its absolute specialist.

The disappearance of the market and the appeal to ethics

It appears from my analysis that we will say of something that *it is written* when this thing cannot be predicted and always resists recuperation by possibility. History is such a thing. As such, *history is written*, and the derivative trader is the subject capable of writing it for the reason that dynamic replication, which is coextensive with the prediction model, inserts him in the market, and leaves him no occupation or reason of being-there other than to exceed prediction, and thus precisely to exercise writing. The derivatives market takes place beyond possibility: it is the capacity of writing. The possible is only *expected* in the market (expectation is but a probabilistic concept), but it is contingency that is materially *processed*, or written, in there. Not to say that contingency disappoints expectation; to the contrary, it literally *moves* (emotionally) expectation, because it supplies the writing material.

This constant writing, which articulates possibility, replication, and contingency, is the material the market is made of. It is both necessary (in the sense that it constitutes the market) and contingent (in the sense of what this material essentially is). The monstrosities of the market (especially the two that preoccupy us here: CDOs and Kerviel) can be interpreted, in this light, as perversions of the writing of history: as *misinterpretations* (*contresens*) perpetrated against it. It comes at no surprise that this should always be due to the misuse of dynamic replication.

And first, as concerns credit derivatives, we see that they make of dynamic replication precisely *no use whatsoever*. The articulation between possibility and contingency is thus absent from their market. The price of the CDO has never been written, but only *expected* (not to say: only hoped for), as if traders had named it and crossed their fingers, waiting. Instead of contributing to stratify and modulate contingency, instead of sealing their payoff while they waited for the final sentence and instead of launching the dynamic replication strategy in pursuit of it, credit derivative products actually left a gap wide open in which contingency could only be tempted to hurl the market down.

This constant writing, which articulates possibility, replication, and contingency, is the material the market is made of

Thus writing could not take place in the credit market and had to literally find another medium. Characteristically, the only possible form of writing throughout the credit crisis, the only thing left to do after the exhaustion of possibility, was the infamous *write-down*, the provisions for colossal losses that banks disclosed one after the other. Above all, this form of writing had become an absolute necessity in order *to make the market come back*. Since the market had literally gone missing, the banks were in fact incapable of *marking their credit portfolios to market* in order to measure their losses. On the contrary, they had to *write down* these losses at all costs, without prior calculation; they had to write the losses *to* the market and not extract them *from* the market, begging it to return. Only thus could they regain any credibility and hope to meet again with the market which they had alienated.

Strictly speaking, this unusual form of writing occurs in the void, which separates us from the market. It is addressed to the market, dedicated to it, like a gift given without return and without a calculating mind.[2] For how can we "expect" the market to return, when the market, or the very place where probability and expectation normally take place, is missing?

Jérôme Kerviel or the secret of private writing

As for the Kerviel-event, it is another form of the misinterpretation of writing. While the mistake of the CDO visionaries was to wrongly envision the market as the place of metaphysical speculation instead of factual speculation,[3] and thus to completely get it wrong as far as writing history was concerned, Kerviel's mischief was to divert history from its natural course. By the "natural course of history" I mean the *track record* of the trader, the ordinary course of recorded events that says of the trader who loses money that he loses money, and of the trader who makes money that he makes money.

Jérôme Kerviel "hijacked" the public record of his trades: he privatized it. There is a fundamental value in the back office, and that is that it materializes the trades of the trader. Everyone must be able to read what the trader writes in the market. Everyone must be able to see the gains that he makes or the losses that he endures. The sociological, historical, and even philosophical writing of the market is nothing other than the written record of these profits and losses.

The sociological reading of traders and of trading floors teaches that individuals end up defining themselves through their *track record*. The social landscape sorts itself into winners and losers. This creates different "social classes," and perhaps even different beings.[4] Thus history can write itself by way of the profit or the loss that transpires outside the system, for all to see and to acknowledge. Kerviel, by contrast, put himself in a situation where he could communicate his profits to no one, and where his loss, once it finally hit (the size of) Société Générale, would write the incredible story that no one would want to hear.

As a result, at the beginning of 2008, Jérôme Kerviel could only wager the *whole amount* he had made at the end of 2007 (the trifling sum of €1.4 billion), for the simple reason that he could neither redeem it to the public sphere, nor leave it and do nothing, nor plan to lose it on purpose. His secret, private history could therefore admit only one of two destinations: either to never end (Kerviel would continue to play in secret), or to annihilate itself (by ending as it ended, this story should never have existed).

This confirms that the market is the way history should be written because deceitful writing, feigned "alternative" writing such as Kerviel has produced, this writing which was to occur inside the system of Société Générale and not inside the market, this writing in which Kerviel was an expert and which he practiced to the exclusion of any other, this, then, could only produce the kind of history that was to have, among all the qualities that history may normally have, only those which contradicted it fundamentally: to be never-ending or to have no existence.

Bad infinity

Kerviel lived outside any market and any writing. His only market, the only thing that he pursued and which defined him as a dynamic trader, was the "market of back office records and scriptures" at Société Générale: the cycle of internal controls which he constantly had to find ways of dodging, and of which we are told that real informers and commentators –Kerviel's true "brokers" – unintentionally kept him informed.

This system of records and internal controls was designed to prevent traders, aware of the enormity of their acts (i.e., of the real market risk and of the size their position should absolutely never exceed), from taking directional positions as large as Kerviel's. Kerviel, however, was not aware of what he was really doing. He was winning by playing Société Générale, not by playing the market. As if he was extracting riches from inside the system of Société Générale itself, a wealth unsuspected by his bosses and fellow traders: something, an unexpected windfall, he once said he wanted to surprise them with.

The market could, of course, reverse its course and go against Kerviel, but this was not the place where Kerviel lived and wrote. From the beginning, his world was the back office system of Société Générale. It is there that he was born and he somehow managed to never leave this place. I even suspect that the senior traders, who first welcomed him to their desk when he was promoted to the front office, taught him arbitrage *before teaching him the meaning of directional betting*. Such a low-profile person should restrict himself to the patient and tedious, almost automatic, activity of arbitrage, they must have thought. Their mistake was to never teach him how it felt to win or lose from first order price movements: or market risk. In fact, Jérôme Kerviel never was a trader and never really knew the market.

Their mistake was to never teach him how it felt to win or lose from first order price movements: or market risk

From the beginning, the story was all written and Kerviel's fate was sealed. We knew that such a "script" would come to a stop only when Kerviel's operation would reach the size of Société Générale. If Kerviel had been made aware, even once, of the real risk, of the real sea that was holding him, or of the real abyss that was about to open beneath his feet and which was the market, then the bubble in which he lived could have deflated before reaching the size of Société Générale. Instead, the market only meant to Kerviel *one of the many internal properties of the system of Société Générale:* quite a minor property and much less significant than the system. This internal property had no other use but to provide Kerviel with a list of instructions, as if harmlessly: instructions to sell and sell more and more as the market went up, instructions to buy back as the market fell, etc. Never before has the title *trader of Société Générale* been better deserved.

It should be noted that the counterfeit writing, which enabled Kerviel to pursue his contrarian history and to double his position without limit, is the same writing which prevented him from revealing his huge profit and ending the story. One and the same misappropriation of writing enabled Kerviel to continue but also prevented him from stopping: one way, perhaps the worst, to write infinitely. As this writing was taking place completely outside history and outside the market (and I find the idea quite startling that the writing of the CDO might also be characterized in the same way: as taking place outside the market), it could not be reunited with history and with the normal course of events but via the abyss of abysmal loss.

There is, in the epic of the CDO, the same monstrous infinity as with Kerviel. There too, the loop is infinite, because contingency threatens the entire market. The expected possible (not the replicated possible) is wagered at the level of the entire market.

I find it totally unacceptable; I find it is total nonsense and a misinterpretation of writing at least as grave as Kerviel's, to inoculate in the body of the market a wager as grandiose and metaphysical as the CDO. Dogmatism is an inadmissible infinity too.

Extremes of the misinterpretation of writing

Pursuing the theme of misinterpretation, I am sure we can find a way to relate the story of CDOs in such a way that their daily existence would appear as a series of fictitious writing and misappropriations of history, as a series of *rebuttals of innovation*, a series of duplications and forgeries just as unoriginal as Kerviel's. Just as Kerviel escaped all back office controls, credit derivatives simply ignored *stochastic control*, which is the mathematical name of dynamic replication. This is because they ignored the underlying.

CDOs briefly experienced a market without underlying; this is why their pricing model was outside the market and could not produce writing. As for Jérôme Kerviel, he briefly experienced a market without history and without the possibility of writing history. Indeed *this* history, the record of profits and losses of the trader, is compulsorily *passive*. It must be written behind the trader's back: in his back office. He must never turn back towards it, as Kerviel did.

Kerviel was the example of a trader *absolutely* without a back office. Not that he had been deprived of a back office for some contingent reason, like being employed by a bank with a primitive or non-existent control system; rather, he himself *actively* turned against the back office. He transformed into an activity something that should have remained in the state of absolute passivity for the trader. The back office had become his front office, and it was just that, the continuous writing and rewriting of false trading records, that had absorbed all his "dynamic trading" capacities. Thus history could only write itself for him privately, to his knowledge alone, like a secret miracle of which he was the lone observer, a miracle the memory of which would absolutely die with him.

By being implicated in the paradoxical writing system internal to Société Générale, rather than in the authentic "historical" market, Kerviel was replicating something too. He, too, was following the market tick by tick in order to "control" a future payoff; he, too, carried out a stochastic control procedure the whole irony of which was that he thereby *controlled the risk control procedures*, continually readjusting his writing in order to keep adjourning the control that would expose him and to defend the premium of his extraordinary "derivative instrument." Or rather, in order to synthesize the formidable payoff that he would only realize at the end; provided, of course, there is an end.

The "dynamic replication strategy" pioneered by Kerviel is contrary to nature. It is not designed

to track a finite payoff that was once written and sent, but only to look backwards and deal only with the back office. It only tries *to duplicate the past and to create the identical*. It only aspires to defend the position that has been amassed already, not hesitating to double it when necessary. It has no other choice but fictitious writing in order to camouflage the ongoing profits or losses. Only fictitious writing can travel in the direction contrary to history and contradict causality in this way.

Now, if we were to pursue Kerviel's logic (that which he made possible) and Kerviel's writing (the fiction he made a reality) to the very end, we would find that he could have equally replicated and leveled off the *whole system*, not contenting himself with Société Générale. From the moment that the principle of *fictitious writing as substitute for the market* is established and the inversion takes place, whereby the back office becomes the front office, there will be only one thing left to limit *in time* Kerviel's infinite history and that is the empirical event that annihilated it at the precise moment it was entering its infinite loop, the false confirmation message which eventually exposed Kerviel's fraud. But there will be nothing out there to limit the *logic* of false writing. Indeed, if the market and exchange material were to all become fabricated material like Kerviel's writing, then why would he stop at the size limit of Société Générale? Why would he not hack into the writing systems of other investment banks (BNP Paribas, Deutsche Bank, etc.) and register all the fictitious transactions he needs in order to finance his position beyond all limit?

In this we see that the strategy, or well-known martingale, which consists in doubling one's position every time the market moves unfavorably, can virtually reach the size of the entire financial system, so long as the principle of fictitious writing – or writing that is *contrary to the replication of ordinary derivatives* – is secured. Kerviel would have ended up touching with a totality, a divinity, of the same nature as the one that founds the value of money. He would have ended up bankrupting the entire market.

This then demonstrates, by *reductio ad absurdum* (the absurdity of Kerviel's whole story), that it is the writing of the back office that really creates wealth (not the trader), and that this writing can only travel one way. It cannot stand being diverted and fictionalized as Kerviel did.

ENDNOTES

1. Cf. Quentin Meillassoux, *Après la Finitude: Essai sur la Nécessité de la Contingence* (Paris: Editions du Seuil, 2006). English translation, *After Finitude* (trans. R. Brassier) (London: Continuum, forthcoming 2008).
2. Cf. Ayache, E., "How Not to Bid the Market Goodbye" (*Wilmott*, November 2007, pp. 42–52).
3. *Factual speculation* is a special brand of philosophical speculation, first introduced by Quentin Meillassoux, which recognizes the fact that everything is contingent but which turns this fact, now recognized to be necessary and unsurpassable and to no longer be factual, into the proper object of its speculation. Thus factual speculation is non metaphysical by definition. It is properly *delivered back to the market* under the form of trading that is derivative-specific. Cf. Ayache, E., "The French Theory of Speculation, Part I: Necessity of Contingency" (*Wilmott*, January 2008, pp. 20–29) and "The French Theory of Speculation, Part II: Necessity of the Future" (*Wilmott*, March 2008, pp. 40–45).
4. Cf. Olivier Godechot, *Working rich* (Paris: La Découverte Editions, 2007).