
Comment

Black holes in risk governance

Received (in revised form): 21st October, 2008

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Abstract Risk governance must change to integrate both technical and sociological breakthroughs. As of today, quantitative models are overweighted in the risk management process. Qualitative models, such as the catastrophe theory, may help more than inappropriate Brownian Gaussian models. Behavioural biases and sociological phenomena such as the scapegoat, 'social control' and 'control as a watchword' entail risk governance being driven by the board of directors.

Keywords: *risk governance, CRO's empowerment, Board of Directors, sociology of control, group think avoidance*

INTRODUCTION

Finance and financial markets have a strong record of dynamic innovation due in part to the increasing level of deregulation over the last 20–30 years, but also because investors inherently accept some level of residual risk; indeed, the possibility of default is even accepted when the stock is AAA/Aaa rated. Most financial products are launched before being back-tested in both bull and bear markets, yet *ex ante* risk forecasts calculated in bull markets cannot match *ex post* measures obtained during bear markets times.

Finance involves high levels of both innovation and rapid implementation and, as such, the level of uncertainty is higher than in more technical areas. Economics has both social and political dimensions, and the chief risk officer

(CRO) must consider potential market events beyond those predicted by the most popular quantitative models. Decisions are also driven by sociological and political forces within organisations. This means the CRO must also manage internal behaviours. For the CRO to be effective here, he must be fully supported by the board of directors.

THINKING OUTSIDE OF THE (BLACK) BOX

There is no market without a valuation process. It is accepted that there may be several valuation types interacting on one single market. This is called arbitrage. The value is the price resulting from a combination of a huge number of variables: time, type of resource needed (currency, raw material, etc), type of economic process (insurance,

debt issue, etc), political and legal environment (interest rates, legal protections, quality of legal systems, etc) and parameters. The complexity is such that economists try to build models based on a selection of meaningful, material features fitting a phenomenon. The main function of models is heuristic: if one understands the specific features of a model, one can forecast the future states of a phenomenon, but these forecasts must be checked to determine the relevance of the model. Financial actors (banks and investors) refer to these models to forecast future values. The result may differ substantially depending on different methodologies or time horizons, or whether one uses a factor or a full-valuation computation tool; a joint-default analysis with a copula framework will replace a more traditional credit risk measure. All the same, these differences in models and valuations do not breach the market's function.

But when the model comes to its limits and assumptions are evidently too far removed from reality (such as recovery rates for subprime loans), or when the practice appears to be based on a black box where investors do not know or understand the pricing model, the market may no longer exist. Modelling the future is not possible with outdated approaches and technical instruments. The results of Gottfried Leibniz and then Emilie du Châtelet were only temporary until the relationship between the speed of light and energy was discovered by Einstein. A new concept arises because the question has been raised differently. Then it takes time until a new stable consensus on shared practices appears and information is computed in this new

way. This is of course the case when Taleb's 'black swan' (a high-impact random event) appears. When Zeeman¹ applied Thom's catastrophe theory² to analyse stock market bubbles and crashes in terms of the speed of price changes, rather than the change of prices alone, he was criticised because his description of traders acting upon fundamental value against chartist traders was not compatible with the theory of rational anticipations.³ Unfortunately, value-at-risk is a panacea and it is important to integrate extreme values into the way the financial world is conceived, which is not possible through Gaussian models (these probability density functions of normally distributed random variables apply under the conditions of the central limit theorem). Market valuation has a psychological component which escapes present quantitative models. Using a qualitative theory, such as the catastrophe theory, thus makes sense as a mental framework, not for predicting future market values, but for imagining a potential evolution — stability and bifurcation — of a universe with up to four control variables.

This is not a quantitative model that will help in choosing to act, whether in the commodity futures regulated market or in the over-the-counter market; this is a question of market depth, regulation, clearing facility, volatility, etc. Statistics are based on past measures from the old world; the game theory supposes rationality and transparency of actors. But when information asymmetry makes this unrealistic, then grafting an evolutionary ('morphogenetic' in Thom's words²) function to historical measures is worthwhile.

The CRO's main function is not to undertake intensive quantitative research

on behalf of the front office, but to understand models, anticipate markets' reactions and raise questions. Understanding models (when they work and when they do not) means understanding the underlying assumptions used to price products and identify potential vulnerability. Anticipating markets' reactions means studying all significant historical events (including regulatory developments) and integrating every potential significant change. It also means the CRO needs to raise questions when he finds black boxes that have not yet been challenged by the market. This capacity is heavily dependent on the CRO's breadth of experience and his knowledge of state-of-the-art research and market features.

BEHAVIOURAL BIAS JEOPARDISES THE CONTROL PROCESS

Behavioural finance has already identified a number of biases in finance.⁴⁻⁷ This knowledge should now be integrated into the control process to avoid the three major behavioural pitfalls — although, first of all, the CRO needs to develop his critical thinking, in order to avoid his own behavioural bias.

Investors and traders behave with an optimistic bias. Risk and reward are the two faces of Janus, and there may be a strong pressure from the investment and/or trading officers to focus solely on reward as their bonus is linked to this reward.

Another important bias towards mimetic behaviour has an important impact on the situation facing the CRO: he may face 'groupthink', that is 'a mode of thinking that people engage in when they are deeply involved in a

cohesive in-group, when the members' strivings for unanimity override their motivation to realistically appraise alternative courses of action',⁸ as well as collective 'polarisation' — the need to make clear-cut decisions that will drive the whole executive team to extreme risk-taking.

The third most important bias lies in misunderstanding the law of large numbers, leading to flawed expectations for mean reversion in the short and long term. Having examined the period from 1871 to 1999, James Montier showed that bear periods for the S&P 500 could last between 12 and 26 years.⁹

How should one act against behavioural bias? Sociology offers a few references. Charles H. Cooley's analysis suggests that the most numerous group in a wider social network achieves its global control through emotional implication, relations dynamism and one-to-one relationships.¹⁰ In financial institutions, the front office is the most populous group and as such may well control the controllers. To avoid being neutralised, the CRO must develop counter-mechanisms to reverse the control process. The control process may include procedures, committees and the classic internal memoranda. It may use judgments, pressures, incitements or sanctions. According to Edward Ross, the most powerful is the internal culture.¹¹ According to Deleuze, the disciplinary system works through watchwords passed through as information.¹² But in a society of control, it is the code that is important and acts as a password. Discipline refers to the old gold exchange standard while control relates to the floating rate of exchanges, and the whole deregulation process. Control is continuous and

without limit (global). Organisation, procedures and limits are parts of the risk management process. But the CRO should not only control investment processes and valuation methods, but also participate in the definition of risk tolerance in the global strategy of the firm, that is the code. In order to monitor this constraint at all times, organisation and procedures should be aligned with objectives. Objectives depend on the stochastic dominance of the board, first or second order: a first-order choice refers to the preference for a moderate but safe outcome (result being reached with a high probability), a second-order choice refers to a mightily higher outcome with a mightily higher loss. However, the board is not usually spontaneously aware of its inclination.

It is imperative for the CRO to raise awareness of the board's risk aversion and articulate it through the different processes, spreading a culture of risk awareness throughout the company.

DETERMINING RISK TOLERANCE AND SUPPORTING THE CRO IS IN THE HANDS OF THE BOARD

Deregulation in western countries has led regulators to a position where they react to crises rather than prevent them. So, after the Enron scandal, the Sarbanes-Oxley Act 2002 was implemented to reinforce measures to prevent corruption among chartered accountants.

Unfortunately, risk managers have no cast-iron rules such as the Generally Accepted Accounting Principles or International Financial Reporting Standards; neither can they turn to a specific regulatory risk body.

Moreover, at least in France, not

every company grants whistle-blowing rights. As analysis from René Girard has shown,^{13,14} mimetic behaviour and internal pressure in the social group tend to turn the controller identified as a foreigner to the community into a scapegoat. A dangerous situation may occur whereby the CRO detects a losing open position, but the investment executives remain hopeful of turning it around by keeping it open just long enough for the markets to recover. The unfortunate controller then finds himself in a situation where he must keep quiet about his warnings lest he be held personally accountable for the executives' losses and lose his own job despite doing his utmost to prevent the losses worsening. Controllers often have solid files substantiating the failure of executive management, but as they cannot go public with insider information it therefore has no value to protect them.

Directors often complain that, despite executive management's assurances that risks are being correctly monitored, there are surprisingly large losing positions to report to shareholders or pension holders. The self-attribution effect reflects the tendency of managers to take advantage of favourable results, whereas they attribute bad performance to 'inadequate' accounting standards or erratic markets, far away from the 'true' fundamental value of the trade.

In fact, most investment executives are bonus and career-driven, while risk managers have to be liability-driven. To avoid these pitfalls, the liability should be better shared, with the CRO receiving a fixed salary, amounting to the average global (fixed plus variable) package of the chief investment officer. In addition, the CRO should also report

directly to the board of directors' risk and audit committee.

Regulators grant some freedom in risk appraisal to banks and insurers authorising them to use internal risk models. But risk management is not a quantitative science; it is a mix of sociological, economic and political practice that requires a qualitative understanding of what really drives the market. For institutions willing to implement a risk management system in a culture unaccustomed to working under disciplinary constraints in a bull market, the most difficult task is to implement a risk culture going beyond quantitative measures. The CRO is responsible for managing optimistic, social and cognitive bias. Without direct support from the board, this is impossible.

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