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PRiM News

Welcome!

To judge the potential impact of investment risk we need look no further than the sub-prime crisis, which continues to be a major topic of public discussion. Although investments linked to sub-prime loans have often been criticised, some of the most highly respected players in financial markets suffered significant losses because they may have underestimated this danger.

In Europe, investment risk is often discussed in the context of the increasingly aggressive investment strategies adopted by traditional investment funds. Not only the growing use of derivatives in the wake of UCITS III, but also the inclusion of structured products and other "new" types of instruments in traditional portfolios are indicative of investment risk in the European fund industry.

The *PRiM Risk Newsletter* Number 12 is therefore dedicated to investment risk. For the interview, PRiM spoke with several experts in investment risk: **Bruno Vanderschelden**, **Managing Director of Mercuria Independent Risk Solutions** in Luxembourg and **David Low**, **Senior Consultant**, and **Frédéric Gielen**, **Director**, of **avantage Capita Limited**, London. The articles in this issue are on stress testing for sophisticated funds by **Christophe Chanudet** of **Fortis Investments Luxembourg**, the recent CSSF circular 07/308 by **Marco Zwick** of **Schroder Investment Management, Luxembourg**, suitability testing by **Pascale Audoli Holz** of **Dexia** and **Robin Marc** of **Accenture Financial Services** and risk management standards for hedge funds by **Armelle Guizot**. As always, your ideas for future issues and your comments are always welcome. Please send them to info@prim.lu.

Bonne lecture!

Paul Kleinbart, Editor

The individual opinions expressed in this newsletter do not necessarily reflect the opinion of PRiM nor of any other contributors to this edition

SELECTING STRESS TESTS FOR SOPHISTICATED FUNDS

Christophe Chanudet, Global Head of Risk Projects, Fortis Investments Group and Risk Manager, Fortis Investments Luxembourg



The new CSSF circular 07/308 regarding the “use of a method for the management of financial risks, as well as the use of derivative financial instruments” established some fundamental risk management principles on Value at Risk (VaR) calculations, stress tests and VaR back tests dedicated to sophisticated funds in the context of UCITS III.

Stress tests with conditional VaR are recognised as the most revealing risk measures for a position or a fund. As stated in the circular:

*“The purpose of a VaR model is the quantification of the maximum potential loss which might be generated by a UCITS portfolio in **normal market** conditions. This loss is estimated on the basis of a given time period and a certain confidence interval. UCITS must complete this approach with stress tests, as described in Appendix 2, in order to **quantify the risks associated with possible abnormal market movements. These tests evaluate the reactions of the portfolio’s value to extreme financial or economic events at a given point in time.**”*

Appendix 2 specifies:

“The Commission requires that sophisticated UCITS follow up on the risk of the occurrence of extreme variations of the risk factors to which UCITS might be exposed through their investments by implementing a rigorous program of stress tests. The program should cover all the risk factors having a non-negligible influence on the portfolio’s value and should also deal with correlation changes between risk factors.

*The **scenarios** defined by Risk Management must be **adapted to the nature of the portfolio’s positions and risks**, and therefore any fundamental change in the investment strategy should be accompanied by a recalibration of the crisis scenarios.*

The calculations’ results must be analyzed by Risk Management and should, if need be,

lead to amended measures for the purpose of adjusting the UCITS' risk situation.

The stress test calculations should be done with a frequency which is in line with the UCITS' risk profile, but, at a minimum, once per month."

The CSSF recommends that "scenarios must be adapted to the nature of the portfolio's positions and risks". The aim of this paper is to suggest ways for risk managers to determine which stress test should be applied according to the nature of portfolio.

Stress tests can be categorised into 2 classes: Historical and Standardised.

Historical scenarios are built to assess what the consequences for a given portfolio would be if the shocks from historical risk factors happened again in a given past period. In order to replicate these shocks, it is necessary to have the variations of all risk factors in the reference period. Providers of risk management software will soon be able to provide us with a scenario for the sub-prime crisis, which was primarily a liquidity crisis.

As opposed to a VaR calculation that includes in its model a history of risk factors, which most of the time is no more than 1 or 2 years old and consequently has a propensity to even out exceptional past market events, historical stress tests take into account only historical key events that led to a financial crisis in the past.

The most commonly used historical scenarios include: Oil Price Shock 01/74; Recession 1981; Stock Market Crash 10/87; Recession 1990; Asian Crisis 07/97 – 01/98; Russian Devaluation (LTCM) 8/98; September 11 2001.

It is important not to consider historical stress tests as worst-case scenarios, since each of these historical events was always due to a shock in the history of one or more specific risk factors.

The effectiveness of a standardised scenario depends on the relevance of its choices: if the

scenario is chosen without considering the nature of the portfolio and more particularly the risk factors to which the portfolio is sensitive, the exercise is useless or will create risk and give fund managers a false sense of security by underestimating the fund's exposure.

Standardised scenarios have the advantage of allowing a firm to compare the results of a single scenario applied to different portfolios whose nature is similar and then to compare the results produced by this scenario at different periods in time.

Prior to choosing a relevant stress test, the following analysis should be carried out: carefully identify and list every risk factor that could impact every financial product in the portfolio.

If we assume that a portfolio is a composition of different holdings (e.g., equities, bonds, derivatives) and that every holding can be priced with a pricing function of n risk factors, such that:

$$P_j = f(t; r_1, r_2, \dots, r_n)$$

P : price of the financial product,

t : today,

f : asset pricing function depending on n variables, and

r_1, r_2, \dots, r_n : risk factors for every holding

Like VaR calculations, stress testing is about identifying asset risk factors (r_1, r_2, \dots, r_n) that could affect the portfolio. A stress test is different from a VaR calculation, since it looks at the risk factors to which the portfolio is sensitive, instead of considering only the recent history of risk factors. It is this process that will determine an explicit impact on the whole portfolio.

From a practical point of view, here is a set of risk factors for the most common holdings:

- for equities, indices and funds, risk factors r are the assets themselves; (for example, if there is illiquidity in the market, because of

a large spread, market players will not be able to trade at quoted prices)

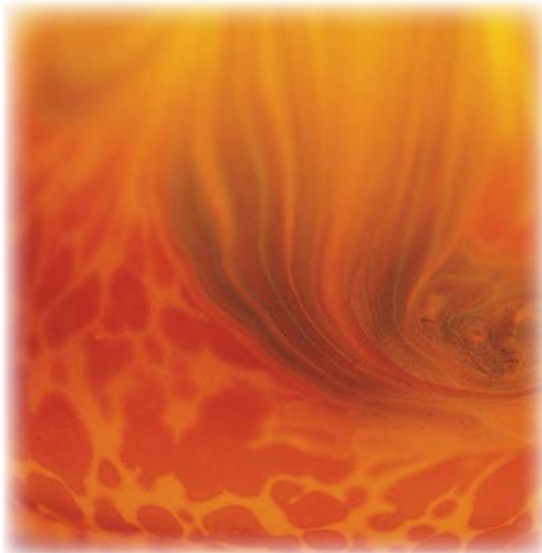
- for zero coupon bonds, we can consider deposit rates, swap rates and credit spreads as risk factors;
- for European equity options, f is the Black-Scholes-Merton pricing formula and risk factors are the underlying stock prices, their implied volatilities and the interest rates (for example a sudden increase of volatility will impact option prices that will prevent market players from reorganising their portfolios at the appropriate time).
- for Euro Stoxx index futures maturing in three months, the risk factors are the value of the index and all the components of the interest-rate curve for the EUR.

To proceed with a useful stress test, the shocks will have to be applied only on the risk factors' history impacting every holding (as opposed to a historical scenario whose shocks can impact some portfolios and not others). A relevant scenario is of course one whose existence is plausible.

For example:

We can consider a convertible portfolio and apply the following combined scenario (*All Equity Markets Down 10% + Underlying Market Volatility +50%*) to highlight its "sensitivity" to its risk factors, which are equity prices/implicit volatility and credit spread/risk free interest rate curve/currency exchanges rates.

Assuming that we have the appropriate risk management software, a scenario



decomposition tool can be used to see the reaction of every asset to a change in the specific risk factors that can impact the pricing of that asset. This combined scenario can be run on two hierarchical levels: asset class & ISIN level, for example.

Let's analyse the result of the first scenario "All Equity Markets Down 10%". In this scenario all equity prices (not the indices) go down by 10%. Consequently you could read the reaction in the price of a bond to the movement of the underlying equity price.

For example, if the change were 10%, this would mean that the underlying option is fully in-the-money (ITM) (i.e., for a call: spot price > strike price), hence an intrinsic value > 0.

- if the change were 0%, this would mean that the option is full out-of-the-money (OTM) (i.e., for a call: spot price < strike price), hence an intrinsic value = 0.

In other words, thanks to scenario decomposition, you can spot the delta of the option from this analysis, which calculates the sensibility of the option relative to the spot price.

Now, if you analyse "Underlying Market Volatilities +50%", in this case all underlying implicit volatilities (that reflect the future volatility anticipated by the market) are increased by 50%. The scenario decomposition analysis would show how much the price of a bond would change for such a volatility shock (this would show the sensitivity of the option relating to the underlying volatility which is a definition of Vega). And for convertibles, if $Vega > 0$, this means that prices go up when volatility goes up.

You may have a zero volatility, when the option is full in-the-money (the option behaves like the stock) or a $Vega=0$, if there is a callability (hard or soft) that is in-the-money, in this case the maximum that you get is the call price and the effects of the option disappear.

We saw that a set of instructive conclusions can be drawn from a convertible portfolio when a scenario decomposition analysis is done and these outcomes enable the risk manager to warn the fund manager about the possible consequences of plausible market changes in a specific context.

Next to VaR calculations, stress tests constitute additional and essential simulation techniques; they answer a precise question: "Considering the nature of my portfolio, what would be its value change, if historical or specific financial events were to recur today?" It provides a useful insight into the behaviour of the portfolio.

The CSSF recommendation that states "The **scenarios** defined by Risk Management must be **adapted to the nature of the portfolio's positions and risks**, and therefore any fundamental change in the investment strategy should be accompanied by a recalibration of the crisis scenarios" constitutes one of the biggest challenges of the recent circular, as it requires a pro-active risk management process.

As an example, during the sub-prime crisis, VaR models found their limits; they were unable to provide adequate information during this liquidity crisis, because the models do not take into account the risk to which a portfolio is exposed during its liquidation. As a consequence, stress tests will become an essential complement to the use of VaR in the future.



CSSF CIRCULAR 07/308: A NEW REGULATORY MILESTONE FOR INVESTMENT RISK MANAGERS

Marco Zwick, Head of Compliance and Risk, Continental Europe, Schroder Investment Management, Luxembourg



On 2 August 2007, the Luxembourg regulator CSSF issued the circular 07/308 on the "rules of conduct to be adopted by undertakings for collective investment in transferable securities (UCITS) with respect to the use of a method for the management of financial risks, as well as the use of financial derivative instruments."

CSSF circular 07/308 updates the previous circular 05/176 on derivatives by:

- prescribing the distinction between sophisticated and non-sophisticated investment funds;
- highlighting the derivative exposure and coverage calculation methodology on the basis of the level of sophistication of the fund;
- distinguishing between market risk, counterparty risk and coverage requirements, as indicated below;
- stressing the need for daily and independent valuation of OTC financial derivative instruments;
- specifying that a UCITS fund may borrow up to 10% of its assets on a temporary basis, except for investment purposes;
- enforcing an organisational distinction between investment risk and fund management.

Definition and obligations of sophisticated and non-sophisticated funds in terms of market risk

Sophisticated fund	Non-sophisticated fund
A sophisticated UCITS is a UCITS using, for an important part, financial derivative instruments and/or making use of more complex strategies or instruments.	A non-sophisticated UCITS is a UCITS with less or less complex positions in financial derivative instruments or with financial derivative instruments used solely for hedging purposes.

Sophisticated fund	Non-sophisticated fund
Daily measure and control of financial risks	Measure and control of financial risks twice a month
Market risk measurement	Market risk measurement
For funds with benchmarks: Absolute VaR total portfolio/Absolute VaR reference portfolio \leq 2	Commitment approach (conversion of derivatives into equivalent positions of the underlying assets): Total commitment \leq 100% NAV
Funds with no benchmark (e.g. absolute return funds): Absolute VaR \leq 20%	Possibility to use VaR
Daily VaR back testing Monthly VaR stress testing	Not applicable, unless VaR calculation applied for non-sophisticated funds

Both relative and absolute VaR are calculated on the basis of the following criteria:

- Confidence level = 99%;
- Holding period = 20 days;
- Historical data = 12 months at least (250 business days), usually longer; shorter periods may be chosen if market volatilities increase;
- At least quarterly up-date of the historical data.

The VaR methodology is completed by daily back testing to validate the assumptions for the VaR model and monthly stress tests to simulate potential losses under exceptional market conditions.

Counterparty risk

In addition to the market risk limitation described above, a UCITS fund's counterparty risk derived from over-the-counter transactions must not exceed 10% of the fund's net asset value per counterparty, if the counterparty is a credit institution (with registered office in

a EU member state or subject to prudential rules considered by the CSSF as equivalent to those laid down in Community law) and 5% per counterparty in all other cases. The counterparty risk is determined by applying the following formula:

[Sum for all contracts concluded with the same counterparty of (replacement cost + add-on on the notional value of the underlying asset)] / 5 for counterparties being credit institutions and investment enterprises of EU origin or those recognised from third countries.¹

The concentration risk is the exposure to a specific issuer, geographical region, asset class or counterparty. This definition implies that the counterparty risk on a same entity or group must be added to the issuer risk resulting from a fund's exposure to transferable securities, money market instruments and deposits with respect to this same entity or group to ensure that the overall exposure to the same entity or group does not exceed 20% of the NAV.

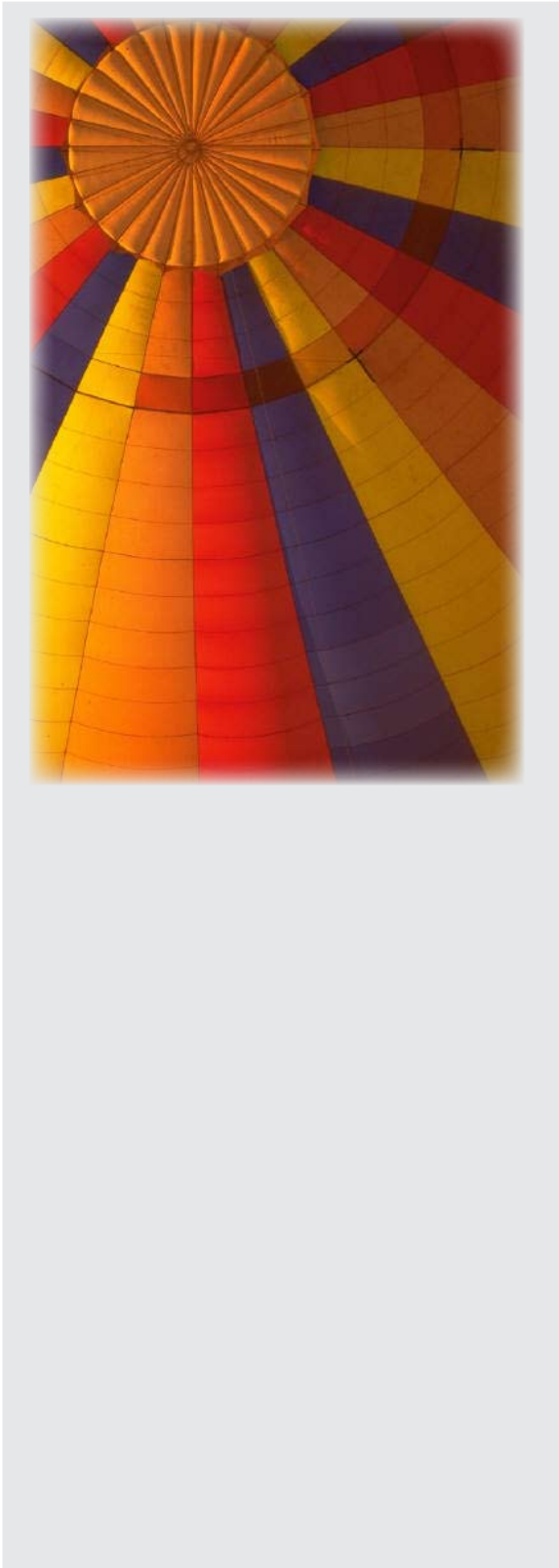
Coverage rules applicable to financial derivative instruments

Any UCITS fund is required at any given time to be capable of meeting the obligations incurred by transactions involving financial derivative instruments and which generate for the UCITS fund delivery and payment obligations. This implies that the fund must verify that the coverage requirements in cash/liquid assets or underlying financial instruments are continuously respected by the fund manager.

¹ The division factor 5 is to be replaced by 2 in all other cases.

TOWARDS A PRAGMATIC APPROACH FOR SUITABILITY TEST EXECUTION IN DEALING ROOMS

Pascale Audoli Holz, Dexia Compliance TFM (Treasury and Financial Markets); Robin Marc, Accenture Financial Services¹



For all the investment firms impacted, the milestone of November 1st 2007 marked the transition of MiFID to a concrete reality. Still even if most uncertainties have been clarified, some practical implementation issues remain. The execution of the suitability test for professional clients in the dealing room context is one of those specific situations. In short, a person in sales is required to execute a suitability test, even for professional clients², before issuing any personal recommendation in order to check that the foreseen personal recommendation fits with the client's investment objectives.

Thus, two main issues are at stake. Firstly, when should we consider that a personal recommendation is provided, and, secondly, if it is provided, how to carry out the suitability test collecting the client's investment objectives?

When should we consider that a personal recommendation is provided?

A personal recommendation on a given financial instrument is provided considering the client's specific situation. Several interpretations can be observed in Europe and we can see that the boundaries between generic advice and personal recommendation are not easy to determine.

As an illustration, some major investment firms consider that providing comparative information on different financial instruments to clients and *in abstracto* from a client's personal situation (a so called "product approach") implies generic advice, which does not require the execution of a suitability test.

- 1 The content of the following article only reflects the point of view of the two authors and not their employers.
- 2 A clarification should be made to indicate that in the suitability test case, the professional category encompasses the traditional MiFID category of professional and also eligible counterparty. For simplicity reasons, only the case per se professionals is considered hereafter.

Others have a more cautious point of view and choose to consider providing their clients with a personal recommendation for each case and decide therefore to carry out suitability tests systematically. Such an approach avoids any “MiFID compliance doubt”, but it entails a significant impact on daily operations. Furthermore, it doesn’t ensure any successful results in the commercial relationship with professional clients.

How to collect the required client’s investment objectives?

Being eager to execute a suitability test does not guarantee that professional clients will provide investment firms with the required information.

Firstly, it is possible that the professional clients provide their investment objectives considering criteria that differ from the investment firm’s own internal criteria. As an example, some professional clients (such as major corporates) could proactively define their own set of criteria for their investment objectives in order to have one single approach with all their counterparties and efficiently and consistently manage their MiFID processes. In this case, the investment firm should successfully perform the mapping between client criteria and its own internal criteria.

Secondly, the investment firms may be confronted with such situations where the client refuses to provide any information on his investment objectives. For a lack of investment objectives, one of the potential consequences should be a cancellation of the discussed transaction before “crossing the Rubicon” (i.e., before completing the personal recommendation). It could become a very tricky problem to manage, if this refusal impacts numerous professional clients. Thus, refusing to deal with professional clients who have failed to provide their investment objectives seems to be more a theoretical point of view than a reality. Instinctive behavior should consist of sticking very strictly to the Directive provisions and not taking any risk, if the investment objectives have not been received or are unsatisfactory, even if an institutional client, who refuses to reveal his investment objectives, would propose a waiver of responsibility for the investment advice provided.

Some partial solutions have been investigated. On the one hand, some investment firms could proactively define client objectives taking into account high-level investment objectives and send them to professional clients expecting either

their express or tacit agreement. But there is still the possibility that the client questions these preset investment objectives without defining, which are the relevant ones. On the other hand and for structured products, a specific approach tailored to the client could be considered. This “tailor-made” approach would consist of deducing investment objectives from the detailed request provided by the client. The sales person would necessarily respond to the client investment objectives, when proposing the corresponding structured product. This proposed solution does not seem fully satisfactory, as its only concerns structured products.

Different approaches may be and have been chosen by market players without any real consensus for the moment. A shared and pragmatic approach within the industry on both the scope of personal recommendations and the way to carry out suitability tests should allow the definition of a common and reasonable path to stay between a systematically controlled approach and day-to-day business practices. This seems to be even more a mutual benefit for all market players, given the specific context of the suitability test execution in the dealing room, where the sales department could have equal, if not less knowledge and experience on some complex products than the targeted prospects or professional clients. Whereas the trends in the Luxembourg marketplace seem to show a limited interest by some investment firms to benefit from suitability test protection when dealing with each other, the paradox here is that an investment firm anyway has to follow a protection process towards a potentially more informed and experienced counterparty. Who really needs protection then, considering that the client could be the best informed and experienced? Certainly the client, given the mandatory requirements on suitability tests, but also the investment firm itself, for which a maximal enforcement of the MiFID provision remains the only certitude to comply fully with regulatory requirements.

Still potential operational and commercial restrictions and distortions in market practices between banks make this option rather unsatisfactory. A smarter and broader protection for all market players could be found through a common and pragmatic position, allowing a clarification of the most important uncertainties in the Luxembourg marketplace.

INTERVIEW: INVESTMENT RISK

Bruno Vanderschelden, Managing Director, Mercuria Independent Risk Solutions & David Low, Senior Consultant, & Frédéric Gielen, Director, avantage Capita Limited



Investment risk is an area with far-reaching implications, which in the wake of the sub-prime crisis has become more topical than ever. To improve our understanding of investment risk and its many facets, PRiM interviewed market experts from two different companies. From **Mercuria Independent Risk Solutions** in Luxembourg, we spoke with **Bruno Vanderschelden, Managing Director**. The other company, **avantage Capita Limited**, is based in London. The people interviewed from avantage Capita were **David Low, Senior Consultant**, and **Frédéric Gielen, Director**.

PRiM: The *PRiM Risk Newsletter* Nr. 7 of September 2006 looked at the new risks associated with UCITS III. One of the key risks identified in that Newsletter was the increasing use of derivatives in UCITS funds. How would you evaluate that trend from an investment risk perspective?

David Low & Frédéric Gielen: The certainty of an investment's return can be affected by a variety of factors, and the effect can be seen in different ways and to a varying extent. It is the combination (and effect) of these factors that we generally label investment risk. Certainly, financial markets instruments such as derivatives play a crucial role in the control and diversification of investment risk by providing an asset manager the means by which to hedge that risk.

So, can the increasing use of derivatives in UCITS funds actually be viewed as an additional or increased investment risk? We question the assumption that there is a direct causal effect. If used in a prudent manner by knowledgeable, skilled, experienced practitioners, should the increased use of derivatives not actually aid the management of investment risk? We hold the view that the increasing use of derivatives in UCITS funds will only represent an increase in investment risk to a corresponding degree of lack of experience of those who use them.

Thorough knowledge and understanding of the derivatives offered and employed by a fund are key weapons in the armoury for dealing with investment risk. It is therefore imperative that asset managers and indeed risk managers are and remain sufficiently educated with regard to the use of derivatives. By actively managing this element of the risk equation, funds will be better managing their overall investment risk.

Bruno Vanderschelden: Personally I think there is a lot of talk about the use of derivatives in UCITS funds, but in reality their direct impact has not been significant. Despite what many people think, derivatives are not necessarily high risk. The real issue in a fund's use of derivatives is the strategy of the fund manager in using derivatives. 130/30 funds¹, for example, are becoming increasingly popular. With them, like with other funds, it is the strategy that counts, not the individual instruments used to apply the strategy. Derivatives have received a lot of attention, because they traditionally have been considered high risk. In fact, derivatives can be very effective in managing risk, if the person using them has the requisite expertise.

"Despite what many people think, derivatives are not necessarily high risk. The real issue [...] is the strategy of the fund manager in using derivatives."

Bruno Vanderschelden

PRiM: Investment risk is often the result of basic issues in portfolio modelling. How would you characterise the relationship between model risk and investment risk?

¹ A "130/30 fund" is a fund that typically uses financial leverage by shorting poor performing equities and purchasing other equities that are expected to have high returns. A "130/30" ratio implies that 30% of the portfolio's value is short and then the money from the short is used to take a long position (130%) in equities that the fund manager feels will outperform the market.

David Low & Frédéric Gielen: Model risk, or the possibility that an inappropriate or incorrectly implemented model will be used to manage a given risk, is increasingly present in the world of UCITS III funds; largely as the result of the increased use of derivatives. It is integrally related to investment risk due to the ever-increasing reliance on models to measure the risks present in a portfolio. Greater exposure to over-the-counter (OTC) derivatives and structured products (as is occurring with UCITS III funds) will lead to an increased use of models, thereby increasing the exposure to model risk.

Much has been written on the topic of model risk and there are varying opinions on how effectively it can be managed – discussion leans toward qualitative rather than quantitative arguments. One of the main components of model risk that we have observed is the quality of assumptions made when designing or choosing a model. The quality of statistical models and data, although crucial, is all but irrelevant if the underlying assumptions for using the data are flawed. Such flaws can be caused by employing faulty logic or simply by not reassessing the ongoing relevance of the assumption in a dynamic environment.

In the context of the derivative market, the fundamental question that needs to be asked when framing assumptions is, can the future behaviour of the derivative be accurately inferred from the past? Does the underlying market on which the derivative is based still operate in a similar fashion to that on which our assumptions are based? This is not a new thing! An example that illustrates this point is the behaviour of

prepayment models in the mortgage market in the early days of market securitisation. These models were based on the (previously) stable behaviour of the home loan market – borrowers were generally holding their mortgage with the one lender for the full loan term, rarely deviating from the agreed amortisation programme. With borrowers becoming better informed and more astute, the home loan market subsequently went through significant changes – increased refinancing with other lenders or accelerated repayment of the debt. The failure to review the key assumption regarding the likely behaviour of the underlying transactions undermined the validity of otherwise sound models.

Essentially, models need to be constantly reviewed: assumptions validated against results and interpretation of results challenged. It is only in this way that

model risk can best be mitigated, thereby addressing investment risk.

Bruno Vanderschelden: Model risk and investment risk are of course closely related, but the key risk in this context is using the wrong model to cover the risk of the

"The failure to review the key assumption regarding the likely behaviour of the underlying transactions undermined the validity of otherwise sound models."

David Low & Frédéric Gielen

portfolio. One model cannot fit all portfolios. For that reason, we need to apply different models according to the unique characteristics of each portfolio. The risk level of a portfolio changes over time. Since value-at-risk (VaR) calculations are based on past or current situations, they need to be updated constantly and considered in the context of a portfolio's changing risk. Choosing the right model starts with the pre-testing – Have we

considered all the risks of the portfolio and does the chosen model cover them? To find an effective model, we need to consider extreme cases, which is why stress testing is also an essential part of the equation.



PRiM: Recent articles in the press have identified a convergence between alternative and traditional funds in terms of investment strategies and methods. Do you think that this trend implies an increase in investment risk among traditional funds?

David Low & Frédéric Gielen: Indeed there is a convergence between alternative and traditional funds and this may imply a rise in investment risk in traditional funds. However, we do not think this should necessarily be viewed as a concern. As we outlined earlier, the rise in investment risk can be managed in traditional funds by employing knowledgeable, skilled, experienced practitioners and the use of appropriate risk measurement tools.

Bruno Vanderschelden: I think this convergence is inevitable and has already become a reality. 130/30 funds are a good example of this convergence. Today many alternative funds manage risk very effectively, while some traditional funds could be considered high risk. I think that our approach to rating risk in funds needs to be redefined. We need better tools to evaluate and monitor risk in all types of funds. Merely using alternative strategies or just investing in derivatives does not equate with a high level of risk. During the "bubble" of the late 1990's, when some high-tech equities actually had negative risk premiums, people did not consider technology funds as high risk. History has showed us how wrong this position was.

PRiM: The sub-prime crisis in the US has had a dramatic impact, as witnessed by the problems of many major players in the market. What lessons about investment risk can be learned from the sub-prime crisis?

David Low & Frédéric Gielen: Of the many lessons that can be taken from the sub-prime crisis, perhaps the two most important

(and interrelated) ones are the need for transparency in structured products and a greater focus on integrated risk models.

It is doubtful that asset managers ever possessed transparent and integrated information on positions and their underlying exposures. Perhaps ironically, it is the very mechanism for trading in Asset Backed Securities (ABS) that has contributed greatly to this lack of transparency: traded with insurance via a trust that provides backing against the performance of the asset pools. This process encourages the investor to 'look through' actual security to the strength of the insurer or credit enhancer.

As a consequence, the rating is often more favourable and the instrument made more tradable. Unfortunately this perception often masks the weaknesses of the underlying assets supporting the securities.

Until quite recently, risk modelling has focused almost exclusively on market risk measures (e.g., VaR). This focus has overshadowed the need for robust and reliable perspectives of other risks over time. Asset managers should conduct continued and frequent analysis on specific customer pools that make up the ABS instrument. This

will enhance their awareness of underlying customer behavioural assumptions. The behaviour (and thus the quality) of the pools is highly fluid, and it is this fluidity that frustrates efforts to find or to reliably track information for the purpose of analysis. Consequently, customer pool information is generally only gathered at the outset of the issuance and not updated throughout its life. Failure to perform ongoing behavioural analysis of the underlying pool results in surprises (most recently negative) regarding changes to customer performance and behaviour.

" I think that our approach to rating risk in funds needs to be redefined. We need better tools to evaluate and monitor risk in all types of funds. Merely using alternative strategies or just investing in derivatives does not equate with a high level of risk. "

Bruno Vanderschelden

Bruno Vanderschelden: The sub-prime crisis in the U.S. illustrates how even the most sophisticated players in the market can misjudge a situation. It is perhaps ironic that even three or four years ago some people were already predicting a sub-prime crisis. My feeling is that situations like the sub-prime crisis often result from a failure to consider investments from a micro perspective and a macro perspective. From a macro perspective, investments in the sub-prime market made a lot of sense. On a micro level, however, things did not look so good. We saw a similar situation with the "bubble" of high-tech investments at the end of the 1990's. Very often the negative results from such investments are attributable to an over-concentration in one type of investment (cf., Amaranth and LTCM). The keys to managing this type of risk are managing concentration levels from both a micro and a macro perspective and continuous monitoring.

"Although perhaps a little trite, the adage often used when describing derivatives – the winner's gain is another's pain – correctly expresses the zero-sum nature of these financial instruments."

David Low & Frédéric Gielen

PRiM: The recent emphasis on risk management in UCITS funds (cf., the CSSF Circular 07/308) has raised numerous issues regarding responsibilities. Who do you think should assume the ultimate responsibility for managing investment risk? What are the implications of your answer?

David Low & Frédéric Gielen: Although perhaps a little trite, the adage often used when describing derivatives – *the winner's gain is another's pain* – correctly expresses the zero-sum nature of these financial instruments. It is the responsibility of the asset management company to ensure that they maximise

their gain. This is achieved by employing the most appropriate models and methodology in assessing investment risk. Importantly, the shift from traditional asset class portfolios to those that incorporate significant reliance on derivatives will require a complementary shift in a risk modelling approach.



Many commentators (including contributors to previous *Newsletters*) have correctly argued that the UCITS funds are at a disadvantage when dealing with other, more established market participants such as investment banks. That is, the sophistication of the investment banks' risk management techniques outclasses the models that have been designed to measure risk within the less exotic portfolios. One course of action is to adjust the risk management infrastructure to cater for some of the derivatives now being included in fund offerings.

The consequences of not taking a proactive position with regard to improving the calibre of risk management will be evident in the disproportionate 'pain' the fund will experience.

Bruno Vanderschelden: For me, there is no doubt that the board of a fund is ultimately responsible for its performance and operation. The purpose of a fund board is to represent and defend the interests of the shareholders. In that function, the board must manage the risk of the fund. While the board delegates the actual operation of the fund to the agents of the fund (e.g., fund administrator, custodian), it is nonetheless responsible for ensuring that the fund is properly operated. If a board finds that the investment risk of a fund is too high, then it first must check the fund's prospectus to see if the fund complies with its stated objectives. If that is not the case, then the board must undertake actions to correct the situation. Should a fund incur a loss due to investment risk, then it is the board that will have to take responsibility for it.

PRiM: It could be argued that investment risk has a "knock-on" effect on other types of risk. Do you agree? Please explain your position.

David Low & Frédéric Gielen: In the context of investment risk being a combination of factors affecting the certainty of an investment's return, we are not convinced that it necessarily has a "knock-on" effect on other types of risk. We are more likely to see the increase in other risks contributing to an overall increase in investment risk rather than vice versa. For example, as mentioned earlier, failure to address increased model risk will lead to an increase in investment risk. However, we can see merit in the argument that a perceived increase in investment risk may influence decisions that ultimately (and perhaps inadvertently) lead to an increase in another specific risk (e.g., operational risk). Therefore, to successfully operate within

this paradigm, it is imperative that fund managers have a fully integrated view of risk.

Bruno Vanderschelden: The "knock-on" effect of investment risk can be seen clearly in the sub-prime crisis that we discussed before. Miscalculations by investors in sub-prime related products have had a major impact on the market. It is perhaps indicative of an efficient market, however, that these problems also lead to opportunities. If a bank has significant losses from sub-

prime loans or investments, for example, then it is likely that the price of its shares will drop, giving investors an opportunity to buy the shares at a low price.

PRiM: Thank you for sharing your views with us.

"The consequences of not taking a proactive position with regard to improving the calibre of risk management will be evident in the disproportionate 'pain' the fund will experience."

David Low & Frédéric Gielen

SIMPLIFIED GLOBAL RISK STANDARDS FOR HEDGE FUNDS

Armelle Guizot



The following article is an extract from the book *Global Code of Standards* by Armelle Guizot (ISBN 0566 088312), which the author has kindly submitted for publication in the *PRiM Risk Newsletter*.

As a means of addressing global systemic risks within the financial industry and others, hedge fund managers should follow a specific set of recommendations, such as:

- **Commonality and Wholeness:** Have a custodian, an auditor, a valuation administrator, a prime broker, and above all, a common infrastructure at the hedge fund level to reconcile all financial, risk management statements and valuation reports from each of the parties¹.
- **Human Resources:** Ensure that the quality of human resources in terms of sufficient professional experience and headcount is commensurate with the level of assets under management. Many hedge funds have cut down costs by hiring a minimum number of staff to manage a large amount of assets. The headcount relative to asset value is much smaller than in a large institutional bank².
- **Altruistic contribution for social vocations:** Each fund should be required to allocate a minimum percentage of its yearly returns to a specific charity or social action that they can drive themselves or redirect to a foundation. The proliferation of hedge funds with limited compliance and risk management rules has so far contributed to discredit governmental banks and funds and erode social causes. While hedge funds contributed to the evaporation of capital flows outside of mature democracies such as the United States and Western Europe, hedge funds must be carefully monitored in the way they develop in emerging markets and in the way they contribute

1 Dubai Financial Services Authority www.dfsa.ae, *Code of Ethics*
 2 *Hedge Fund Compensation Report 2007-2008* www.hedgeworld.com

to the development of those markets, notably without forgetting the creation of their middle classes. The trading of pricing inefficient and financial valuations distortions manipulations can contribute to excessive gaps between mature markets and new emerging ones³.

- **Cultural-Moral:** Establish a culture of compliance, morals, and integrity and have the codes of ethics, of conduct and standards applied strictly⁴.
- **Define All Risks and be aware of them:** Ensure that all risks described in *this Code of Standards* are adequately managed, staffed and technologically supported. Verify that the managed risks include market, credit, technology, systemic, collateral, counterparty, pricing, valuations, legal, compliance, liquidity, regulatory, financial, security, operational, infrastructural, counterparty, liquidity, redemption and process⁵.



- **Infrastructural and Operational Risk:**

- 3 EurekaHedge index of hedge funds that have a social contribution and purpose. As of end of 2007, there are 600 funds that are charity and altruistically driven.
- 4 Consult all codes from industry participants such as AIMA, BIS, CFA, MFA, SGFIA, IOSCO and IAS.
- 5 *The Hedge Fund Compliance and Risk Management Guide*, Wiley 2006, Armelle Guizot and *Managed Futures Association of the United States of America Report 2005. Hedge Funds and Operational Risk*, IncisiveMedia, Armelle Guizot January 2007. *Basel Capital Convergence Standards, A Revised Version June 2005* www.bis.org; and CESR Committee of European Securities Regulators; *Market Abusive Practices 2006*.

Establish an operational risk policy that defines all systemic inherent infrastructural risks of the fund and remedy to all of them with new systems, people and controls. Create and allocate an operational risk reserve. The operational risk framework should have a commonly shared system interacting with all parties dealing with the hedge fund. The operational risk manager should collect all risks from each part, register them in the system and assign risk grades. The operational risk system should log self-evaluations, scorecards and risk grades according to the rating buckets 1 (worst), 2 (average), 3 (good), and 4 (excellent). The operational risk manager should also interact with custodian, prime brokers, auditors, and administrators also to account for their own risks when dealing with the hedge fund .

- **Credit, counterparty and collateral asset valuations:** Have a common platform to re hedge dynamically and intraday collateral assets valuations in case of counterparties' downgrades and changes of economic exposures. The common web platform at the fund level should be able to match dynamically hedges by strategies and re-evaluate credit risk exposures by counterparties⁶.
- **Pricing and Valuation of Assets:** Implement a valuation and pricing policy: Reconcile prices, valuations and positions with all third parties such as prime brokers, custodians, and third party administrators. Compare and rectify valuation policies with respect to data sources, time zones and verification tools⁷.
- **Independent Investor Rating and**

- 6 www.isda.org (International Swap Derivatives Association). The common Web platform may be one of the technology solutions that are provided in *Hedge Fund Technology*, www.palgrave.com, by Armelle Guizot November 2007.
- 7 www.aima.org, *Asset Pricing and Fund Valuation Practices in the Hedge Fund Industry* April 2005.

Education: Technology tools and rating templates provide hedge funds investors with a new innovative way of analysing and monitoring risk exposures⁸.

- **Data, Information and Sources:** Have more than two data pricing sources to verify market liquidity and pricing accuracy. Data sources should be from different national data providers such as USA, France and or Russia⁹.
- **Capital Adequacy Reserve:** Create a provision or a reserve for adverse market moves causing financial losses. Integrate hedge fund risk management within the *International Convergence of Capital Measurement and Capital Standards: A Revised Framework. June 2005*. Hedge funds' internal risk management programmes should comply with the Basel risk framework in order to treat risk levels and standards in the same way as those attributed to large banks.

The methodology and background logic for integrating hedge funds in the Basel framework is discussed in 'Hedge Funds and Operational Risk' and 'Global Unhedged Hedge Funds' (IncisiveMedia). Reserve a financial provision for operational risk erosion losses by markets, countries, products or strategies. Review the reserve with a product, strategy and regional committee to ensure that it corresponds with the actual risk taking. The reserve should also correspond with the collateral asset valuations changes and with the hedge fund risks exposures with the prime brokers. The exposures to the prime brokers should correspond to the fees paid by hedge funds for the credit risk exposures

that the prime brokers take on their behalf¹⁰.

- **Policies and Procedures:** Write and apply with consistency the initial trading methodology. Trading methodology describes technologies, models, systems to price quantitative derivatives and structured products. It defines the historical data streams to model the returns and the trading strategies. It is a reference tool for regulators, auditors and risk managers to monitor investment strategy consistency over time. Ensure that the trading methodology is in line with the investment agreement and the prospectuses¹¹.
- **Trading and Investment Objectives:** Do not deviate from original investment agreement. If deviations occur, explain and document the reasons for such changes of the original strategies. The hedge fund manager should develop and maintain an investment objective process. *Trading Methodology Allocations:* Implement a trade allocation policy and a trade error policy. Trade allocation policy should be in line with the capital adequacy framework and trading limits established by regions. The hedge fund manager should have policies to define pricing errors, overrides, and failed trades¹².



8 *Hedge Funds and Operational Risk*, IncisiveMedia, 2006.

9 www.capco.com, all databases: www.hedgeweek.com, Hedgeworld Lipper at hedgeworld.com, CISDM, EurekaHedge. For data risk management, see *Hedge Fund Technology* at www.palgrave.com.

10 *Hedge Funds and Operational Risk*, IncisiveMedia, 2006. A. Guizot.

11 *The Global Hedge Fund Code of Standards*, GowerPublishing, March 2008. A. Guizot.

12 Author's risk management templates to conduct due diligence and to monitor Trading Methodology and Capital Allocation.

- **Compliance and regulatory due diligence:** Develop a compliance program that includes codes of ethics, of standards, of conduct. The compliance department should ensure common registrations with all regulatory bodies to avoid overlaps or duplications of bureaucracies. Compliance should maintain relationships with regulators and inform them of ongoing trading activities. Compliance should ensure that all legal forms and registrations are completed. Implement a thorough anti-money laundering policy; know your customer and global investors identification verification programs¹³.
- **Technology and Infrastructure:** Establish significant technology that corresponds to the capacity of the fund. Deploy systemic technologies to support quantitative risk management algorithms and pricing models. Technologies should have infrastructural robustness and architecture to support large global portfolio models and complex pricing models that have been independently verified and validated. Validate data and pricing models independently with the technology according to a specific validation methodology¹⁴.
- **Implement back, middle and front office technologies** specifically designed for hedge funds. Have technologies independently validated. No Excel spreadsheets or Access databases should be used to price complex derivatives. The hedge fund should have adequate back-and middle office systems that process trades, clear and confirm them.

The back and middle office operations should include adequate controls to avoid backlogs in trade confirmations and errors. Timely proper booking of trades in the appropriate legal entity would also consequently ensure that dynamic hedging is correct according to actual live valuations of booked trade valuations and prices. The hedge fund manager should have specific obligations to establish and maintain risk management systems and controls to identify, mitigate, control and monitor risks



to operations.

The operational risk framework should monitor backlogs in trade confirmations and verify that all trade term sheets are signed and properly booked in the right legal entities. Backlogs are attributed to late trade confirmations and non-notification of trade assignments and novations by relevant parties and are exacerbated by high volume trading also often performed by heavy day trading activities of hedge funds. To monitor backlogs and untimely booked trades, hedge funds should have back office procedures and controls to remedy those risks. Part of the back and middle office process of the hedge fund should include trade reconciliation between service providers such as prime brokers and execution brokers, administrators, custodians, auditors and others.

Reconciliation between entities has been prescribed in Hedge Funds and Operational Risk. It can be performed

13 *Global Unhedged Hedge Funds: Corporate Governance and Regulations by Markets*, IncisiveMedia, January 2007. A.Guizot

14 *Hedge Fund and Technology*, www.palgrave.com, A. Guizot, November 2007.
<http://www.soa.org/library/monographs/other-monographs/2007/august/m-as07-1-15-abstract.pdf>

electronically intraday and archived with new technologies prescribed in Hedge Fund Technology. Reconciliation between prices and positions should be documented and archived by an individual or a group independent of the entities that undertake the trading and investment management function to ensure the integrity of the process. The hedge fund operational risk manager should also interact with counterparties to ensure that they have proper systems and controls to monitor backlogs and the operational processes of trade cycles.

- **Verification standards:** Audit externally and regularly on a rotational basis with different auditing corporations.
- **Security Standards:** The fund must have some policies about protecting its internal models, prices and intellectual property rights. The fund must have encrypted messages to clients, specific data collection and archiving tools and firewall devices to limit the intrusion of outsiders. Security standards require having a business contingency plan and disaster recovery plan¹⁵.
- **Third Party Relationships:** Define relationship with outsiders who are likely to access and use pricing data and model information parameters. Ensure that prime brokers are not in a conflict of interest between their hedge fund brokerage services and their own asset management branch, which also manages their hedge funds. Verify that prime brokers also have their own risk matrices to monitor their respective hedge fund risks.

Hedge fund and Prime broker risk recommendations:

- Verify the stock lending and borrowing policy of the prime brokers to ensure liquidity of the fund. The hedge fund should review the operational risk framework of the prime brokers' hedge funds services with those of its own hedge fund boutique. The hedge fund is exposed to competitive market share, if the prime broker has a hedge fund and operates in the same market with the same strategies and geographies and acts against the client, to which the prime broker furnishes services.
- The hedge fund operational risk manager should verify the adequacy of the infrastructure and systems of the prime broker to deliver the services. For instance, how many days does it take to clear, settle and process complex structured products? Do the prime broker prices match those of the administrators and of the hedge fund manager? What is the reconciliation policy of the prime broker and how different is it from the pricing policies of the hedge fund and the administrator?
- The hedge fund operational risk manager should review the interest rates and fee structures of the prime broker and compare them with the credit risk exposures taken by the prime broker on behalf of the hedge fund. The fees should also be compared to other prime brokers given the credit risk exposures of the hedge funds vis-à-vis prime brokers.
- The hedge fund should review the prime broker's securities lending structure, the collateral assets' valuation policies and the cost for safekeeping.
- The hedge fund should analyse the prime broker documentation such as margin calls, leverage, change of limits policies, overnight liquidity emergency policy,

¹⁵ Booz, Allen, Hamilton, *Convergence of Enterprise Security Organizations*, November 8, 2005; the alliance for enterprise security risk management.

synthetic products trading, segregation of assets and events of default and scenarios simulated on the funds' positions.

- The hedge fund should monitor the leverage that the prime broker agrees to support given its infrastructures, credit limits extension, collateral assets valuation policy.
- The hedge fund should review the prime broker policy on segregation and ownership of assets. This includes the creditworthiness of the prime broker, the regulatory regime applicable to the prime broker and any credit rating. The hedge fund should review the prime broker operational risk matrix with respect to *"Basel Capital Convergence Standards: a revised framework (June 2005)"*:
 - Implement a security standards policy with encryption of communications, archiving of data, savings of communications, firewalls, security audits, business contingency planning and disaster recovery, personal and firewall protection and insurance.
 - Establish limits, scenarios, parameters to monitor risks. Manage market, operational, collateral, counterparty and credit risks at a micro and at a macro level after reconciling all strategy hedges at the fund levels. Market risks entail that extreme value at risk, the 24 risk ratios, tilted stress testing and event risk scenarios are simulated live and intraday with adequate technologies. Credit risks signify that sufficient minimum collateral asset valuations are generated and that counterparty credit risk matrices are also monitored daily.
 - Have investors and managers independently measure the risks according to the operational rating standards [Guizot 2006]. Investors should monitor their own prices and positions with live technologies with which they are able to log in and act dynamically with traders to manage intraday risks.
- Separate accounts to isolate risks of pension fund assets, onshore and offshore.
- Have each department adequately staffed and managed with appropriate human resource. This entails that the fund has sufficient head count proportional to assets under management, technologies, human working hours and assurance of benefits commensurable to life of the fund and industry survivorships and mortality rates.
- Deploy Basel, MiFID, Sarbanes Oxley and other regulations within hedge funds, if applicable in the regions of trading mandates to be consistent with institutional compliance standards.
- Have a new product and market committee to conduct preliminary risk management assessment from all departments such as finance, accounting, risk, technology, pricing, trading, audit, product control, compliance, legal, management, to accept the new product, strategy or market prior to trading.
- Dissect and analyse all potential conflict of interest between and within entities dealing with the hedge fund¹⁶.

¹⁶ KPMG Systems Survey 2007, Banks, Fund Administration and Life Insurance Companies, David Dominique, Vincent Koller, and Alain Picquet.

PRiM News

News

News



In November, PRiM entered into a media partnership agreement with **Business Review**. Under this arrangement, **Business Review** will be reporting PRiM events and PRiM will offer **Business Review** support on risk-related issues. Coverage of PRiM's Model Risk conference appeared in the December edition of **Business Review**.

With effect from 2008, all fully-paid members of PRiM will receive a one- year free subscription to **Business Review** as part of the agreement.

Our website continues to be enhanced and now includes a paid-members' section, currently open to all on our mailing list, but with effect from the end of January this will be for members only.



WELCOME TO OUR NEW BOARD MEMBERS



PRiM is delighted to announce the appointment of two new board members to its board of directors, **Ravi Beegun**, Partner KPMG Luxembourg, and **Thomas Nummer**, Head of the Investment Risk/Compliance department of Allianz Global Investors Luxembourg S.A. Both will add valuable experience to the current team of board members and we look forward to welcoming them to the board as we prepare



for an active 2008 on a broad range of fronts. Ravi and Thomas are each presented in more detail via the press release that was placed on our website in December.

NEXT EDITION: **March 2008**

THEME: **Reputation Risk**

CONTRIBUTORS WELCOME