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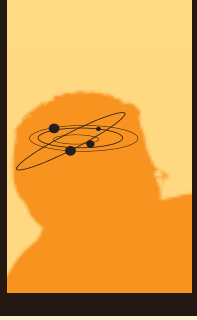
PWM
PROFESSIONAL WEALTH MANAGEMENT
SOLUTIONS FOR EUROPEAN DISTRIBUTORS



INTRODUCTION

AVOIDING A NASTY SURPRISE

Fixed income does not mean low risk. Improperly measuring it may give the wrong impression that a portfolio has a low risk profile, which can lead to unpleasant surprises. Riskdata explains why this is so

There is essentially a three-stage process to constructing a fixed income portfolio for private clients, involving fund selection, strategic risk control and risk aggregation.

When selecting fixed income funds, for a relevant comparison, performance must be risk-adjusted. It is easy to generate temporarily attractive returns by taking risks. But in addition, the ability of a fund manager to report his risks means he understands them and is therefore capable of managing them.

Strategic risk control is also vital. Keeping the relative risk of one's liabilities against one's assets under full control requires the ability to aggregate both risks in an effective way and, in particular, to capture all cross correlations.

Matching liability constraints implies, in practice, an optimal balance between various geographies (US, Europe, Asia, emerging markets, etc.) and markets

When selecting fixed income funds, for a relevant comparison, performance must be risk adjusted

(equity, fixed income, commodities, real estate, etc.). At the same time, sustainable returns require an expert manager in each segment. The portfolio manager then needs to aggregate the risk across the various asset classes in order to get the overall strategic risk profile. This explains why risk transparency of each fund is an absolute necessity.

Effective risk transparency does not mean formal positional transparency. This is not only because positional transparency does not solve the problem of complex instruments: wrongly specified instruments result in erroneous risk figures and, consequently, in wrong trading decisions.

Crucially, sending positions to a third party for risk measurement does not represent an effective in-house risk management process. On the contrary, it often hides poor attention to risk issues. Effective risk transparency means the ability to deliver:

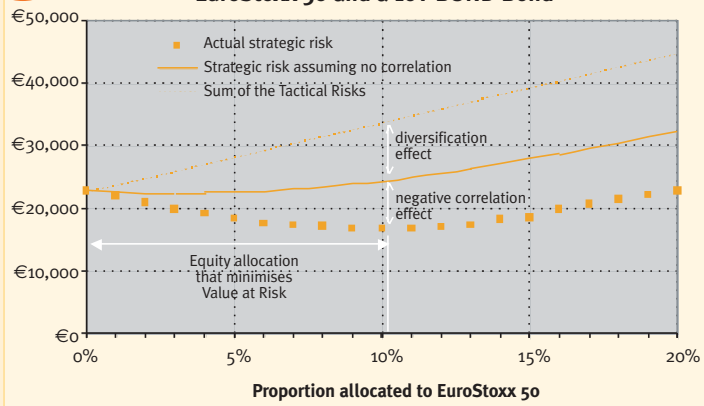
- A reliable predictive risk figure: ex ante estimates must predict ex post volatility measures.
- In-depth capacity which enables the risk manager to explain the consistency of his risk exposure with the investment strategy. Risk can be good if, and only if, it corresponds to managers' views.
- The possibility of highlighting the specific risk drivers of the fund. The risk of a fixed income arbitrageur who hedges his bond position with futures won't be caught by a simple parallel bump of the swap curve. Similarly, the relative risk of a fundamental asset manager with respect to a bond benchmark index can be totally ignored by a pure duration analysis.
- For derivative users (swaptions, options on futures, cap-floors, etc.) or highly leveraged funds, the capability to report asymmetries in return distribution as well as implied volatility risk.
- An aggregation of the various risk reports, capturing all cross asset class correlations for clients. For instance, under current bear market conditions, a small proportion of equity (10 per cent) is an efficient hedge against interest rate risk, because of the negative correlation between fixed income and equity markets (see Chart 1, page 26).

SOURCES OF RISK

Risk/return analysis in fixed income is generally limited to the impact of a simple yield curve parallel shift (ie, duration/convexity analysis). In reality, the story

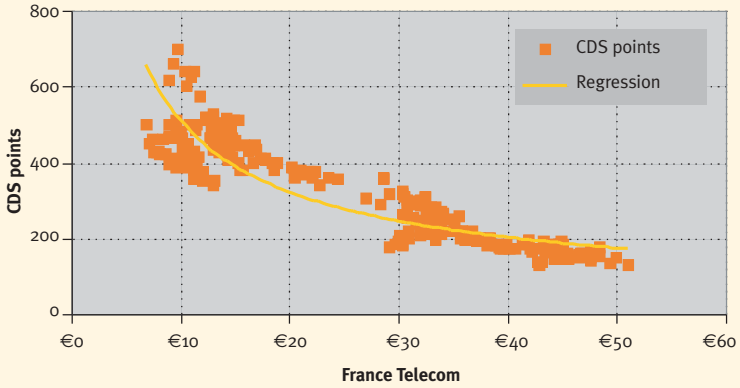
1

Value-at-risk (1mth, 95%) of €1m invested in EuroStoxx 50 and a 10Y BUND Bond



2

5Y CDS France Telecom 12 Sep 01 to 14 Nov 02



Source: Riskdata

is not that simple, for several reasons.

Diversification (across countries, industrial sectors, etc.) reduces risk, but up to what point? The answer lies in the correlation between yield curves, between currencies, and between yield curves and currencies.

Tracking error with respect to a benchmark bond can easily be fully independent from a simple yield curve shift, and can be driven purely by so called "residual risk", such as the rotation of the curve, its curvature, or the swap spread. In addition, unlike in equity markets, correlation depends on the horizon of time on which returns are computed.

Fixed income arbitrage (cash and carry, bond vs swap or future, cross-maturity spreads, etc.) is seemingly almost risk-free, as long as rates stay within certain limits. Managers are inclined to take large positions, which may turn out to be disastrous when these limits are reached (remember LTCM). Liquidity becomes one of the most crucial issues, but not the only one. Dots need to be connected between normal conditions and choppy markets.

MODELS

Factor models, which are broadly used in equity markets for portfolio design, are not suited to fixed income markets. One cannot model asset prices as a linear combination of factors, inducing traditional portfolio theory to fail.

In order to ensure that, whatever the possible arbitrage strategy, no risks are ignored, the Riskdata system has been designed to independently model every highly liquid yield curve in each country and currency – swaps, government bonds, interest rate futures. Each of these is represented by a broad range of parameters to anticipate any possible arbitrage strategy: parallel shift, rotation up etc. up to 14, corresponding to increasing oscillating deformations. Corporate bonds are modelled with a yield spread individually attached to each bond.

In terms of numerical methods, Riskdata's system relies on Monte Carlo plus stress testing. This is an additive and intuitive representation of the risk, and therefore the smartest answer to aggregation issues. In the fixed income markets, it is the only method allowing such complexity to be correctly handled, particularly because of non-linear dependencies (see Chart 2) and the necessity to mitigate many heterogeneous risk sources.

Risk transparency in fixed income requires a powerful simulation tool, one which is both intuitive and interactive and is capable of handling all the so-called "residual risks" and non linearity, which are the real drivers of fixed income portfolio risks. Furthermore, it must be integrated in a consistent cross-asset class framework. The aim of Riskdata's technology is precisely to address jointly all of these issues, thus enabling effective risk transparency.

Raphaël Douady (Riskdata Research Director) and Olivier Le Marois (Riskdata CEO)

CORPORATE STATEMENT

Riskdata was founded by a team of scientists, finance professionals and IT experts. Its aim is to offer to all money managers easy, interactive and intuitive access to a powerful unified risk framework. It is supported by leading figures, such as Professor Robert Mundell, a past winner of the Nobel Prize for Economics. It is the first service offering a daily updated view across all market classes: equities, bonds, listed and OTC derivatives. As an interactive system, rather than classic ASP model, there is no exporting of clients' positions.

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