

# Structured products boom



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Over the past quarter, we have seen a sharp acceleration of demand from investors for commodity-linked structured products. Commodities are now established in the market as an asset class outperforming other major asset classes and offering diversification. We still view the commodity markets as booming, with favourable fundamentals: an underinvestment in commodity infrastructure to replace old resources and a global demand expansion, with a specific focus on China and India facing socio-demographic changes bringing greater industrialisation and wealth domestically.

### **FROM PRIVATE BANKING TO INSTITUTIONAL AND RETAIL MARKETS**

The commodity structured market was initially based on the appetite of private banking investors looking for higher performance opportunities than bonds and equities. This segment has pursued its growth and we have also seen an additional layer of retail demand in western Europe and Asia through listed certificates on domestic exchanges. SG has been particularly active in Germany and Italy so far and is seeing growing demand in other regions. Institutional investors have traditionally used commodity and index swaps, and are now following the trend towards more sophisticated products embedding options in their investments.

### **PURE COMMODITY PLAY**

The bulk of investors are playing directional strategies and the general view is on the bullish side. Typically, an EMTN on a basket of commodities including energy, industrial and precious metals, and agriculture allows one to be exposed to the anticipation of global higher commodity prices without the necessity of a specific view on a single underlying.

### **YIELD-ENHANCEMENT PRODUCTS**

Besides the directional play, a number of investors want to take advantage of the high volatility of the commodity market and are focused on the coupon they can obtain on an annualised basis. Most of the products in this category are playing the probability of a commodity remaining in a defined range of prices over a period of time. Corridors, range accruals and similar products using barrier options have been copied mostly from interest rate and forex structured products to offer an enhanced coupon.

### **INDEX OR BASKET?**

Investing in a specific commodity requires following the underlying market and understanding its fundamentals accurately. Baskets are the best

answer because they offer the most flexibility and allow all kinds of combinations and weightings. However, the choice of the basket can be viewed as complex by novice investors and indexes constitute a good alternative. They generally have a wider commodity base, with up to 30 movers, and are recognised and publicly available benchmarks. They are the preferred underlying for the institutional investors.

### **A NEED FOR SOPHISTICATION**

The commodity structured market is becoming increasingly sophisticated, with structures from equity and interest rates derivatives being imported. Clients active on other asset classes are willing to replicate the structures they are familiar with. This has required development of pricing capabilities to serve client needs best on the structuring and also on the secondary market with bid/ask spread and sizes similar to other markets.

### **WHAT'S NEXT: GOING INTO HYBRID PRODUCTS OR ENLARGING THE SCOPE OF PURE COMMODITY PRODUCTS?**

The demand for complex structures is growing and the challenge is to feed the market with clever trading ideas on top of directional trades. The sophistication is heading in two directions: more complex pay-outs on the commodities, and cross-assets products combining commodities, interest rates and foreign exchange.

### **CONCLUSION**

We anticipate more investment allocation in commodities year on year, fuelled by diversification needs, yield-enhancement requirements and the growing importance of commodity prices in the global economic outlook. The current bull story on commodities is certainly an important parameter explaining the interest of the investment community in commodities. However, given their historical volatility, we believe commodities will remain a good play in the future, offering many opportunities for high returns.



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The first quarter of 2005 was again an extremely active one in the equity and fund derivatives industry. Business levels and client appetites remain high, although we see differences between certain regions. In particular, South-east Asia and some mature markets in Europe have experienced a slower pace. More generally, I would like to highlight three trends that are currently driving the equity and fund derivatives industry in terms of the nature of products and clients.

■ The nature of products has been adapted to market conditions. After many years of vega-negative products, investment banks have launched a lot of vega-positive products, taking advantage of the current low levels of volatility. As a result, we have observed that the long-term volatility has started to take off. This is an illustration of how a change in the nature of products can generate a market trend.

It also indicates that building structured products is no longer only about finding a clever idea, but it is also about creating a product that takes advantage of market conditions by making correct anticipations. As a result, synergies between trading and sales/structuring have never been so important for innovation. Such exchanges have enabled the successful launch over the past months of several products that anticipate the rebound of long volatility or the increase of dividends.

■ A new category of structured products has also proven to be popular among investors: multi-asset class products, providing exposure to a variety of asset classes in the same vehicle (equity, credit, fixed income, real estate, commodities, etc).

In the current environment of low returns across most assets, such products allow investors to benefit from performance peaks among all classes. Decorrelation of the underlying asset classes pave the way for pricing optimisation and innovation in terms of payout and indexation.

■ A third trend concerns the nature of structured products investors. While structured products took off in the 1990s thanks to the retail distribution of banks and life insurance unit-linked policies, the weight of institutional investors (pension funds, insurance companies) is now peaking upwards.

This is a result of the poor returns of traditional asset classes, which lead institutional investors to seek new types of assets, as well as the adaptation of products and services provided by investment banks. Institutional investors require more transparency, more reporting and a better understanding of how the product is constructed and what parameters will affect its secondary market valuation.

In other words, they cannot afford to invest in black boxes. Investors need to be able to incorporate structured products into risk management tools and methodologies. They need to understand what the impact of structured products will be for their asset/liability management, in terms of sensitivity, correlation, risk, etc. For these reasons, some investment banks are developing some specific pricing tools for this client segment.

Therefore, they are providing a full range of services to answer the needs of institutional clients, rather than solely selling products for their intrinsic value. This clearly creates a new cost of entry in the business, for only investment banks that have the skills and the capacity to deliver vast services will enjoy a sustainable success with the largest institutions.

As a result, investors should always think before they purchase a product about the type of investment bank they want to work with. For instance, a 'stop and go' policy is not necessarily the best way to build up a sustainable capacity in research and development, information technology (IT) systems and consequently quality of services. The stability of staff as well as the coherence and pertinence of the development strategy are more important than ever.



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### PRICING CDOS WITH A SMILE: JULIEN TURC

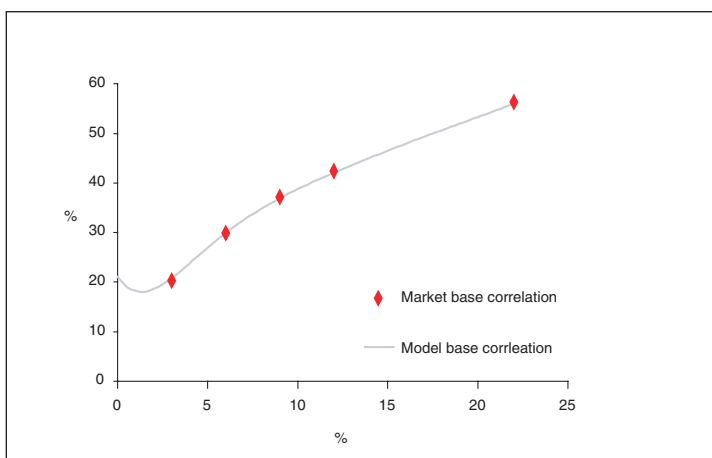
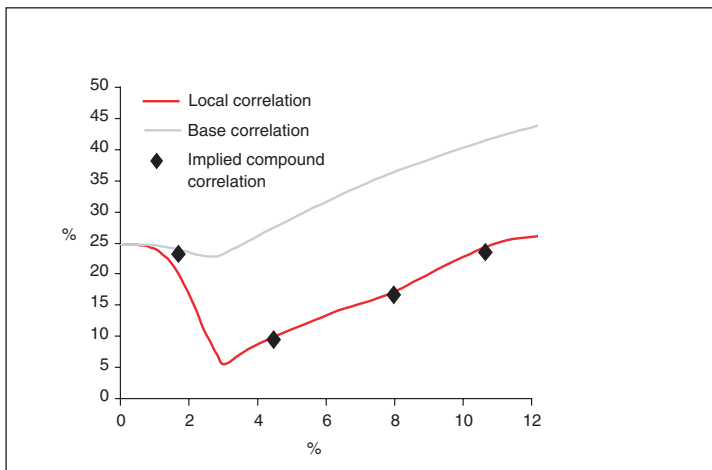
The DJ iTraxx contracts launched in June last year have brought liquidity to the European credit market. Liquidity on second-generation derivatives has also improved substantially, bringing more visibility to complex and technical markets. Tranchéd iTraxx are a good example of this evolution. As iTraxx provides normalised portfolios, standardised tranches can be defined to set up a real market of structured credit products. Transaction costs on these instruments have sharply decreased due to the low bid-ask spreads guaranteed by iTraxx market-makers and an increasing number of investors.

Analytics have also substantially changed as the standard Gaussian copula approach is now the established way of pricing single-tranche collateralised debt obligations (CDO). Thanks to the simplicity of this pricing framework, tranchéd iTraxx prices can be interpreted in terms of 'implied correlation', isolating market spread factors from pure correlation effects. The presence of dealers and the availability of frequent quotations have led to the formation of a true 'correlation market'. The Gaussian copula can be compared with the Black-Scholes model used in equity derivatives markets. Despite its naive view of real economical mechanisms, it remains easy to understand and use. A smile market effect can be similarly observed when implying correlation from trading prices on different tranches.

The market has felt, however, the need for a coherent framework in which either index tranches or non-standard correlation products (CDOs squared) could be valued. The Gaussian copula model does not provide an adequate solution for pricing simultaneously various tranches of an index

Recent research has explored some of the ways to account for the so-called correlation smile. Among these attempts, the most successful ones make correlation a function of the global systemic factor or, in other words, the economy. This is a simple and powerful idea: default risks should be more correlated in an adverse economic environment. Yet these models typically involve a wide range of hidden parameters and unrealistic assumptions on issuer-specific correlation. Moreover, they still rely heavily on an abstract 'state-of-the-economy' factor that is not likely to appeal to practitioners.

SGCIB quantitative credit strategy has proposed a new model, which similarly makes correlation a function of the economy but adopts a descriptive approach and starts from market observations to specify the correlation model. The model also differs as correlation is supposed to be a smooth and homogeneous function of the economy. Any deteriora-



tion in economic fundamentals affects all issuers at the same time. There is in fact a striking similarity between this model and local volatility frameworks used by equity derivatives traders to cope with the deficiencies of the Black-Scholes formula.

Local volatility models are a simple deviation from the Black-Scholes framework, where the volatility of the stock is a function of the stock price itself (and time, eventually). A decrease in equity value typically generates an increase in this local volatility, and this mechanism allows the model to fit the volatility smile. To highlight the similarity between these two approaches, the economic dependent default correlation is also called the local correlation.

A simple formula based on the 'large pool' approximation can be set up for deducing the local correlation from the market correlation smile. This approximation is often used by practitioners to get fast prices for correlation products. This method assumes that the underlying basket is large and sufficiently homogeneous to be considered as a perfectly diversified portfolio of identical assets, which makes sense to value tranching iTraxx products.

Within this approximation, the level of losses on a portfolio depends only on the state of the economy. For each strike, only one state of the economy triggers a level of losses as high as the strike. Each strike can be associated with this state of the economy. Thanks to this mapping, it is therefore possible to consider the local correlation as a function of detachment points of equity pieces, making it a very concrete and intuitive variable. It can finally be proved that implied compound correlations observed directly from market prices can be viewed as first-order approximations of the local correlation curve.

It does not seem possible to extend all these results in the general case. We think, however, that the mapping of the economy into a strike and the proximity with implied compound correlations observed in the market helps build local correlation in a more natural way. The local correlation model manages to fit tranching iTraxx prices and captures the slope and convexity observed on the base correlation market. The numerical efficiency is simply due to the good specification of the model and its proximity to market observations.



High-margin businesses are intensely competitive and accompanied by considerable associated risks. If not managed properly, these risks can eat into potentially lucrative business lines, eroding profitability and putting considerable pressure on back- and front-office, risk management and operations staff. The fast-growing structured products business is no exception to the general rule.

The market has done nothing but grow, not only in Europe, but in the Middle and Far East and US as well. Banks, distributors and investors have clambered into the market in ever-greater numbers in a bid to develop or capitalise on the better yields, pay-outs and protection offered by the instruments. Volumes have escalated beyond expectation, innovation has proliferated and complexity has escalated along with it. The customised spreadsheet-based systems that some have been using to develop and manage their product bases has been tested beyond reasonable expectations, affecting speed-to-market adversely, stretching internal IT resources, and putting an additional burden on risk management processes.

Incorporating new instrument types into existing pricing and processing systems can take months worth of coding, using valuable IT staff time as well as demanding committee-level scrutiny, to ensure that the processing effectively addresses the task in question and reduces the associated operational risk. Yet innovation is not an optional extra for those wishing to operate in the market – it is now an imperative. And without a pricing and processing system that can handle all sorts of instrument, including the ever-more exotic new structures that need to be dreamed up one minute and integrated into the system the next, without the need for programming or a system upgrade, market participants are at a critical disadvantage.

Reflecting the need for speedy and flexible solutions that manage the process from idea through to product development, sales, deployment, settlement and management, Summit began working on just such a system in 2002. By mid-2003, just such a prototype had been successfully demonstrated to leading European and US banks. Since then, the technology has been refined and re-refined by Summit in conjunction with HSBC, one of the largest players in the structured product market globally. The team-based relationship ensured the final product met real client needs as well as exploiting all the available technology. The result was Summit's Multi Underlying Structured Trade

(MUST), a generic application for structuring financial instruments that can handle, price and process the vast majority of asset classes.

MUST has revolutionised the structured product process. It enables users to structure, process and manage products through to settlement in one single integrated system. Its product-builder tool enables quant or structuring staff to design financial instrument structures with unprecedented ease, ensuring creativity remains fully tapped throughout the process. A user-friendly, graphical tool, it allows them to play with different components, defining and redefining interlinks and relationships, comparing and contrasting cash flows and pay-outs, and running what-if scenarios for potential products. In this way quants can quickly and efficiently design several structures simultaneously, or different versions of single structures to meet distinct client demands or investment mandates. Only once the product-testing and design process is complete, does the structure get presented to end-users or sales teams to market. At that stage, the system's state-of-the-art security structures ensure that different levels of access can be tailored to suit distinct user groups, so that traders can retain top-level access, while reduced input parameters can be established for others that access the system.

Equally important are MUST's fully integrated capabilities. Because it provides front- to back-office support, right from the design to the settlement and trade management stage, MUST diminishes the need for extensive staffing to manage the structured product business, keeping operational risks down to a minimum, at the same time as increasing margin potential. Alternatively the powerful API capability means that users can opt to integrate MUST with their own front- and back-office solutions seamlessly.

But MUST is more than a panacea for just the sell side. Its technology is equally applicable and useful for the buy-side users who can install it as a stand-alone module or with individual Summit system components. Investors can thereby define their own products, examining the relationships between different products and pay-outs, rather than having to buy these blindly from providers. When devising MUST, Summit also developed a generic pricing model – an extension of the Brace-Gatarek-Musiela (BGM) multi-factor model to include equities and foreign exchange – and ensured that it was compatible with its trade definition. The buy side can use this to generate consistent valuations across product types, and gain a better understanding and control over the associated costs.



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**Q: Has there been any major change in the market for structured interest rate products over the past few years?**

**A:** The life cycle of structured interest rate products has shortened significantly, while the volume has risen. Compared with a few years ago, when a successful product was offered exclusively by a small number of banks oth-

ers lagged by months, but competition now catches up within weeks. Mathematical models and technology have become widespread and more participants are able to value complex payout profiles, which has created a fast, developing environment. Besides rising volumes, the major change has been the increase in complexity of the products and the growing importance of retail transactions.

**Q: How do customers benefit from this development?**

**A:** The market is more efficient than ever before. Retail investors are becoming more experienced with complex products, liquidity has improved and margins have narrowed significantly. Consequently, it is much more attractive for customers to invest in an ever-expanding suite of exotic products.

**Q: What has DrKW done to adapt itself to the changed market conditions?**

**A:** Competitiveness and success in structured products depend on two important underlying factors: a unified risk and research platform and the ability to get closer to clients. At DrKW, we have consolidated vanilla options and structured products into one trading unit. This is crucial: first, vanilla options are essential for the calibration of models used to price complex structures. Second, the vanilla options desk supplies the liquidity for hedging activities needed to price deals aggressively. Reciprocally, vanilla markets are often driven by flows in the structured business. An integrated book allows better risk management, positioning and pricing. Additionally, we have integrated our quantitative research team within the front office to ensure seamless communication. This structure, combined with a highly flexible model framework, allows us to minimise the time from the idea generation to the realisation of the new product.

**Q: How does DrKW differentiate itself from the competition?**

**A:** Aggressive pricing and an integrated platform, which allows us to react to market changes quickly and to offer state-of-the-art products in a timely manner. Combining this with our structuring expertise, we can offer tailor-made solutions for individual requirements. DrKW has structured itself to combine all derivatives in the various asset classes in one platform. Utilising our structured note desk we have a transparent client facing hub that allows us, not only in IRD but in all asset classes, to judge the overall market demand for various products and let us focus our resources quickly on what best fits our clients. This is what our customers appreciate: getting to the idea first and a seamless professional and competitive service throughout the whole investment cycle.

**Q: What is your view on the future of the market for structured interest rate products?**

**A:** Advanced models allow the pricing of almost every payout profile imaginable. There are two major continuing issues. Firstly, it is essential to ensure that the product offered to clients is in line with their market view and risk appetite – at DrKW we have a strong commitment to do that.

Secondly, it is important to remember that models do not describe reality perfectly but create something as close as possible to it. Prices derived from any model require assessment by traders to compensate for deficiencies. DrKW relies on robust modelling techniques and the assessment of experienced traders. This has ensured pricing quality and consistency across our structured product range for more than a decade.