
Future trends in the structured credit market

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Jochen Felsenheimer*

heads the Credit Strategy and Structured Credit Team in the Global Research department at UniCredit. He holds a PhD in economics from the LMU in Munich.

Philip Gisdakis

is Senior Quantitative Credit Strategist at UniCredit. He studied mathematical finance at the University of Oxford and holds a PhD in theoretical chemistry from the TU Munich.

*UniCredit, Bayerische Hypo- und Vereinsbank AG, Arabellastrasse 12, D-81925 Munich, Germany
Tel: +49 89 378 18188; Fax: +49 89 378 3318188; E-mail: jochen.felsenheimer@hvb.de

Abstract In recent years, credit markets have been characterised by the strong growth of credit derivatives and structured credit, not only in terms of the volume of derivatives traded, but also the number of underlying reference entities and the complexity of the payoffs involved. The subprime turmoil, however, might be the turning point for the structured credit market. While there are apparent consequences for the future of credit derivatives, in the long run the crisis will also highlight the more subtle deficiencies in the existing market structure. The obvious conclusions are: (1) in the medium term, investors will avoid complex structures, and (2) trade in plain-vanilla credit default swaps will increase, as these have been the only instruments to remain fairly liquid during the crisis and provide a hedging tool for investors. In addition, there is a structural change in the credit market which is largely independent of cyclical aspects. The trend towards imposing credit derivatives technology on other asset classes continues, with collateralised debt obligations on equity default swaps, commodity swaps and foreign exchange markets having already been established. In the long term, the so-called collateralised asset obligations regime is expected to replace old-fashioned risk-return optimisation.

Keywords: *credit derivatives, structured credits, subprime crisis*

IN THE AFTERMATH OF THE SUBPRIME TURMOIL

In recent years, credit markets have been characterised by the strong growth of credit derivatives and structured credit, not only in terms of the volume of credit default swaps (CDS) and other credit derivatives traded, but also in terms of the number of underlying

reference entities and the complexity of the payoffs involved. Before the recent turmoil in the financial markets, these 'innovative' instruments mainly allowed investors to have a highly-leveraged exposure to credit assets with significant risk. This trend was driven by tremendous demand for high-yielding assets against the background of the

tight spread valuation in the aftermath of the 2001/2002 credit crunch. Moreover, high demand in the structured credit arena (specifically collateralised debt obligations (CDOs)) accompanied by new credit risk modelling techniques created a fairly liquid market for so-called default correlation risk. However, the advances in risk modelling as well as the tremendous liquidity that was enjoyed by even esoteric instruments, such as the tranché-ABX (tradable index tranches referring to a synthetic asset backed securities (ABS) pool), did not prevent market participants from completely mispricing risks globally. This is highlighted by the huge amount of downgrades that hit CDOs on ABS instruments, a class of structured credit products that refers to structured credit products as an underlying (aka CDO²). A significant number of such highly complex derivatives were downgraded from initial AAA ratings (on a senior and even super-senior level) to deep into junk bond terrain. S&P, for example, announced a downgrade on a specific tranche from AAA to CCC-, which amounts to 18 notches. However, the very optimistic view on credit markets in 2006 and at the beginning of 2007 also caused the launch of other 'Goldilocks instruments', ie instruments which include a huge leverage to generate a decent spread income at the expense of rising risk. The best example was the introduction of constant proportion debt obligations (CPDOs) in the third quarter of 2006. CPDOs are leveraged instruments which refer to liquid credit indices (like iTraxx or CDX) and initially carried an AAA rating. Recently, however, rating agencies started to downgrade the most

aggressive instruments, which lost almost 50 per cent of their market value during the credit crisis. The aggressive leverage mechanism is reflected in the fact that the leverage in CPDO increases if the net asset value (NAV) of the portfolio declines. This strategy is successful if one assumes a kind of mean reversion assumption for credit spreads. It does not work in a long-lasting downturn in credit markets. The success of CPDO-like instruments in 2006 and 2007 shows that investors simply did not expect this downturn to occur.

While there are two quite apparent consequences for the future of credit derivatives, in the long run the crisis will highlight also some more subtle deficiencies in the current derivatives market structure. The two obvious conclusions are: (1) in the medium term, investors will avoid complex structures, and (2) trade in plain-vanilla credit default swaps (CDS) will increase, as these were the only instruments to remain fairly liquid during the crisis and provide a hedging tool for investors, while the cash bond universe, for example, was almost completely shut down during the days of thunder. While the first finding will result in the re-emergence of more simple and straightforward structures, like plain-vanilla corporate credit CDOs, the second will boost the development of linear CDS products on other asset classes, such as loans and ABS tranches. This is because the main problem for portfolio managers was the lack of simple but suitable instruments in order to manage their portfolios. Due to the complete shutdown of the cash market, ABS investors could hardly reduce their exposure even if they would have accepted lower prices. In the corporate

credit area, the situation was not so severe, as CDS markets were up and running. The segment-specific outcome, however, is based on the transmission mechanisms in the crisis. While the crisis started as a subprime issue, it quickly expanded and affected other asset classes. However, the current product range does not offer instruments that allow hedging of such 'event correlation risks' when a crisis spills over from one asset class to another. Nevertheless, the current credit derivatives toolbox has the templates to structure such products. Before the crisis, the first steps down such a path had already been taken, but due to the current crisis, demand for these products completely dried up, as the involved structures and pricing issues are quite complex. In the following, the paper explores these trends in credit markets, which, given the current market environment, admittedly take a more long-term perspective.

NEW PRODUCT TRENDS IN CREDIT MARKETS

In general, there have been two major trends in credit markets regarding the development of new products: imposing derivative technologies from other asset classes to credit underlyings and using credit derivatives technology for other asset classes. The former trend is reflected in the use of already established instruments from the equity and fixed income universe for credit-risky instruments, eg constant maturity credit default swaps, credit default swaptions or even range accruals on credit indices. The trend towards imposing credit derivatives technology onto other asset classes found its latest peak in the creation of CFXOs (CDOs referencing foreign exchange markets) and CCOs

(collateralised commodity swap obligations). CDOs are increasingly developing as an instrument that can be applied to many markets, while credit-risky CDOs still dominate the market in respect to pure size.

In March 2007, the subprime shock started to hit credit markets, bringing the Goldilocks period to an immediate halt. Spreads widened not only in the risky part of the credit universe, but especially in the structured credit market, affecting higher-rated subprime-linked instruments like residential mortgage-backed securities (RMBS) and CDO transactions in particular. The impact on the market was devastating. The whole securitisation market lost liquidity, issuance volumes dropped significantly, and it led to the end of some structured investment vehicles (SIVs). Indeed, the crisis has had a profound impact on the securitisation and structured credit business as a whole. Risk premiums will remain at elevated levels for a longer period, which in turn has had a strong impact on the economics of securitisation transactions. In a first reaction, synthetic CDO issuance in the third quarter of 2007 dropped by 50 per cent compared with the previous year. Concurrent with this, a trend of moving back to basics can be identified — simple bespoke CDO transactions are gaining again in popularity, while complex structures (eg CDO squared on ABS underlyings) are much less popular than in previous years. In addition, repackaging of existing instruments/structures ran into trouble during the subprime meltdown (eg some CPDOs lost almost 50 per cent of the investment amount). The logical response to the current situation is for investment banks to restructure

distressed products by including new features such as mark-to-market (m-t-m) immunisation.

Besides changes in the market which are primarily driven by the credit cycle (depending on the spread valuation, the risk perception of credit investors in general, and the relative attractiveness of credits compared with other asset classes), there is also a structural change in the credit market which is largely independent of cyclical aspects. In the following, the paper describes the trend towards collateralised asset obligations, ie the increasing use of credit derivatives technology as a tool to create instruments which carry an innovative risk-return profile, the impact on credit portfolio management, and the effect on recently emerged vehicles such as credit derivatives product companies, special purpose vehicles (SPVs) and SIVs.

THE TREND TOWARDS COLLATERALISED ASSET OBLIGATIONS

The trend towards imposing credit derivatives technology on other asset

classes continues, with CDOs on equity default swaps (EDS), CCOs (commodity swap CDOs) and CFXOs having already been established. This is likely to be a lasting trend and, in the long term, the so-called collateralised asset obligations (CAO) regime is expected to replace old-fashioned risk-return optimisation.

Given the confusion regarding the characterisation of specific transactions in the CDO world, a rather simple classification is introduced, focusing on the major parameters rather than on pure theoretical constructs. CAOs are defined as structured and tranching investments on an underlying instrument, from imposing waterfall principles (as is the case in plain-vanilla ABS structures) up to single-tranche features (as is the case for single-tranche CDOs (STCDOs) in the iTraxx universe). The next level differentiates between collateralised fund obligations (CFOs) and collateralised trigger swaps (CTOs).

CFOs have been around since the beginning of the 1990s, referring to

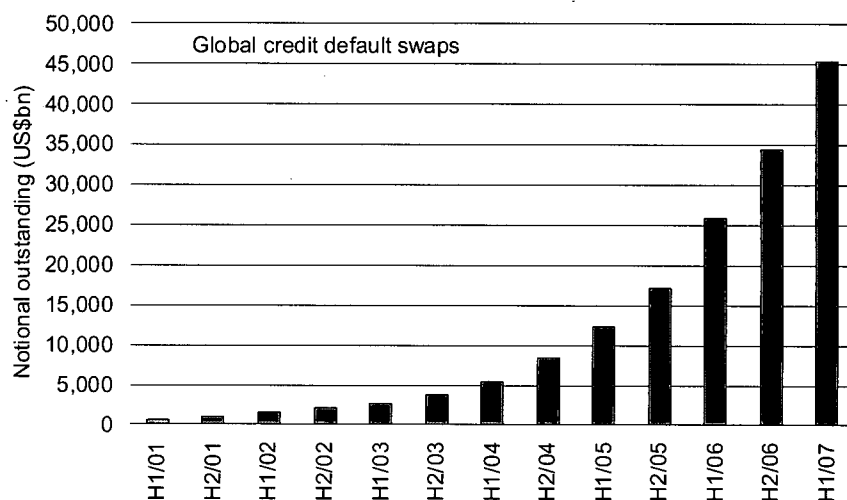


Figure 1: Growth of the CDS universe exploded
Source: BIS, BBA, UniCredit Global Research

underlyings like hedge fund portfolios, etc. The definition is linked to market value CDOs, as the underlying collateral is an m-t-m instrument. For example, a CFO refers to indices on a price level, such as commodity indices, hedge fund indices and obviously equity indices. In particular, CFOs are assumed to fit the needs of real-money accounts that are interested in new investment technologies in asset classes with which they are already familiar.

Traditional CFOs (or market value CDOs) were introduced in the early 1990s, although the product has not become as popular as its counterparts on the cash-flow side (for example, cash-flow CDOs). Although there are some (rather disappointing) examples, the basic concept adds value, especially if the market-price correlation of the underlyings is attractive (ie constantly negative).

In 2000/2001, CFOs experienced further publicity, with hedge fund investments being included. The idea was to use a technology that generates benefits from a combination of highly-volatile and uncorrelated trading strategies (long-short equity, convertible arbitrage, event-driven, fixed income (FI) arbitrage, etc). On the negative side, these CFO investments included multiple fees due to the investment in tradable funds. According to S&P, securitising hedge fund investments can provide the following benefits:

- attractive financing terms;
- transferability of existing portfolios of fund investments;
- diversification of the investor base by providing fixed-income investors with market exposure linked to hedge fund returns;

- new opportunities for investors seeking leveraged returns in this asset class.

In 2003/2004, CFO activity linked to hedge funds slowed due to accounting issues, but market interest remained. Figure 2 shows a typical CFO structure with the underlying portfolio including several strategies (eg macro systematic, FI relative value, distressed debt, convertible arbitrage and equity market neutral).

In contrast, CTOs refer to trigger-swaps, such as EDS, CDS, commodity swaps, etc. All the above-mentioned products (eg CDOs on EDS and CFXOs) can be characterised as trigger baskets, independent of the overlay being a waterfall structure or simple single-tranche constructions. In general, this can be seen as a favourable playing field for hedge funds and prop desks given the unfunded nature of the investments.

From the perspective of portfolio diversification, CTOs are preferable as they offer the opportunity to tap the market for event risk. Tail events are the major risks in such a structure, while the structural features, as well as the unfunded nature of such transactions, are similar to the synthetic bespoke CDO market. The key features can be summarised as:

- unfunded nature — trigger swaps as underlying (waterfall principle for distributing interest and principal payments in the underlying pool not needed);
- tail-event risk as the major risk factor;
- tail-event correlation as a major pricing input.

What does this mean in practice? In

general, CFOs smooth the risk-return profile of highly volatile asset classes. For example, the risk-return profile of a tranching investment in equity markets might be favourable compared with an investment in the underlying portfolio. In equities, for example, the simple question is how a portfolio of far-out-of-the-money puts (EDS) behaves compared with the underlying stock portfolio. While optimising the underlying still refers to well-known risk and return approaches, with the capital asset pricing model (CAPM) still being the appropriate portfolio model to look at return, risk and correlation of returns in a portfolio context, CTO correlation has a default correlation-like character.

How are tail events correlated? Obviously, it is important to stress intersegment-specific correlation assumptions, eg using structural models to receive tail-event correlation for equity and debt. In commodity CDOs, specific macroeconomic shocks might lead to a trigger event (corresponding to a credit event in the CDS market). Tail-event correlation in different hedge funds is probably linked to systematic, regulatory and legal risks. Consequently, a multi-asset CTO offers the opportunity to benefit from (so far) non-tradable 'asset classes' like inter-market correlation.

Traditional correlation patterns between asset classes are changing in a CTO regime, with idiosyncratic risk factors losing in importance compared with systematic risk factors. The risk-return profile of CTO tranches differs significantly from the risk-return profile of the underlying assets, shifting risk away from volatility towards tail events, while the impact of correlation changes

obviously depends on the specific tranche investment. For example:

- A long position in an equity piece of a commodity swap CDO is long in joint probabilities of large price swings in the commodity market.
- A long position in a mezzanine piece of a foreign exchange CDO is short in joint probabilities of distortions in the market (exposed to currency crisis).

To sum up, CTOs are a major milestone in financial markets. A rising number of investors are currently benefiting from the attractive structural features, while traditional management methods are losing importance in a CTO-regime. Tail-event risk is not only interesting from a transaction-driven perspective, but also in respect to diversifying 'volatility-driven' portfolios. Despite concerns regarding demand/supply patterns, both demand and supply for tail-event risk is immense given the huge variety of players in this market. Traditional tail-event risk-driven companies (eg insurance sector) are probably skewed to selling this kind of risk to players like hedge funds, banks and fund managers, who can implement attractive trading positions, but also optimise multi-asset portfolios.

This simple structure allows one to ignore special structural features in those transactions. In general, a CFO is a funded investment, while a CTO is unfunded (swap-like), although structural features can be implemented so that structures are possible. The basic idea of all these products is the imposed structure; in a CFO transaction the risk is market risk (volatility of the underlying), while in a CTO it is event risk (due to the swap-character of the underlying).

Hence, a CTO, as well as a CFO that refers to the same underlying, in general bears a totally different risk-return profile. One can construct a CFO which refers to specific m-t-m instruments, like commodity and equity indices. If one takes the corresponding swap contracts (to these indices) and uses them as an underlying in a CTO, the risk profile of the transaction changes dramatically. While the CFO is highly sensitive to m-t-m changes in the underlying indices, a tranching CTO investment better withstands short-term price fluctuation, being rather skewed to trigger events (which are tail-events). Thus, the major difference between a CFO and a CTO is that volatility is the appropriate risk parameter in the former, while tail-risk is suitable for the latter.

Although a CFO offers an interesting opportunity to buy exposure on a specific portfolio with an attractive risk-return profile, such structures are not as innovative as a CTO. A CFO tranche can be easily replicated using options strategies. In general, an investor in a CFO tranche is long a call option with a strike equalling the detachment point, while writing a put striking at the attachment point. That said, if options are available, a CFO structure can be easily replicated using plain-vanilla instruments. Investment in a CTO tranche, however, refers to tail-event risk. Thus, while a synthetic replication using derivatives is theoretically possible (when ignoring correlation effects), the tail-event correlation risk is one of the dominant factors in such an instrument and cannot be hedged using plain-vanilla derivatives. In addition, one would have to use digital rather than plain-vanilla options. To sum up, the CTO is obviously the more innovative instrument.

CREDIT PORTFOLIO MANAGEMENT — ON THE EDGE

Against the background of the market's innovative power, the low-yield environment, the trend towards passive management and the changing market structure towards dominance of structured credit players, the current trend in credit portfolio management can be described as a revolution rather than an evolution.

The major trends in credit markets require new management technologies on a portfolio level to reflect both a change in the structure of the market and an appropriate way to generate value in a market characterised by rising complexity. The major trends in the market require a revolution in credit portfolio management.

There is rising pressure on actively managed plain-vanilla portfolios from the development of passive products. In addition to certificates referring to credit-risky instruments (eg first-to-default baskets or even iTraxx equity tranches), credit exchange traded funds (ETFs) are also becoming more popular. Recently, iTraxx ETFs have been launched, offering non-derivatives players access to the derivatives universe. The introduction of future contracts can also be seen as competition for actively managed credit portfolios, especially in periods of low volatility and low alpha generation power.

The low-spread environment forces market players to generate additional yield income by moving down the quality curve or increasing leverage on their investments (or a combination of both strategies, as seen recently). Traditional fixed income management with corporate bonds as yield enhancers has been losing attractiveness. The effect

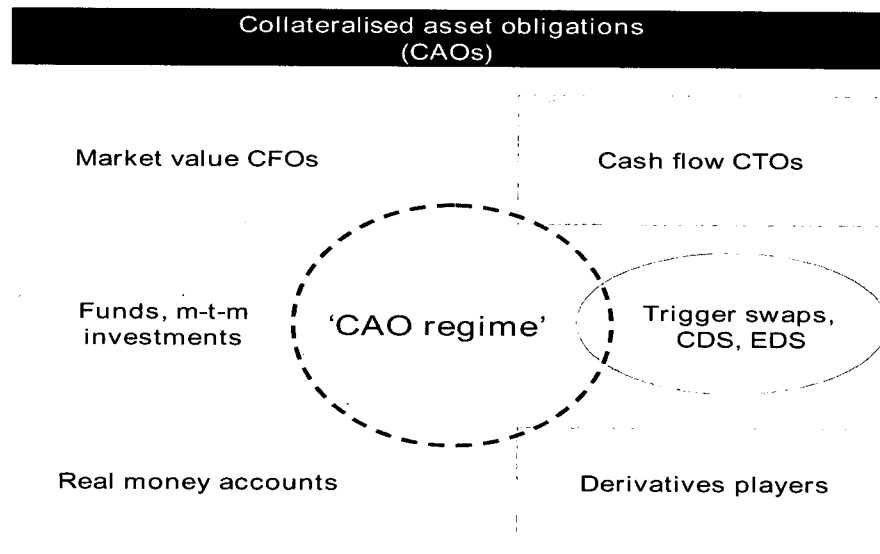


Figure 2: Classification of collateralised asset obligations
Source: UniCredit Global Research

of active management is less important in times when spread volatility and default rates are low, especially when taking management fees into consideration.

The development of innovative instruments in the credit derivatives universe allows investors to build up positions which refer to specific parts of credit risk (eg spread volatility products or primarily default-sensitive instruments). While the standard valuation approach for these instruments is still skewed to a pure transaction-driven style (isolated view on the instrument ignoring interdependencies with other instruments), one can expect the portfolio perspective to become more important. Finally, managing a complex structured credit portfolio requires identification of the sensitivities of specific instruments to derive the sensitivity of the whole portfolio. This is a prerequisite for optimising structured credit portfolios.

Consequently, the future of credit portfolio management is not a Markowitz-like risk-return optimisation. Cash corporate bonds will diminish in importance in such a portfolio, with new products providing more attractive risk-return profiles. Latest product developments in the credit derivatives and structured credits universe offer the opportunity to implement modern portfolio management methods, for example, core-satellite strategies, overlay structures with futures and portable alpha strategies. The combination of structured products and new management methods justifies a management fee even in a low-spread environment. However, this also puts enormous pressure on managers of straight corporate bond portfolios to adjust their management style and push new product processes. The future of credit portfolio management is bright only for those who implement innovative methods and instruments.

NEW MARKET PLAYERS: WHAT WILL HAPPEN NOW?

The structural change in the structured credit universe has also been reflected in the establishment of new market participants. While the market for synthetic structures is already pretty well established, many real money accounts remain outsiders due to regulatory hurdles and technical limitations, eg to participate in the correlation market. Against this background, three vehicles that offer easy access to structured products for these investors have grown in importance: credit derivatives product companies (CDPCs), permanent capital vehicles (PCVs) and SIVs. The trend towards such vehicles is also accompanied by a change in management style, as these companies invest primarily in high-quality portfolios.

A CDPC is a rated company that buys credit risk via all types of credit derivative instruments, primarily super-senior tranches, and sells this risk to investors via preferred shares (equity) or subordinated notes (debt). Hence, the vehicle uses super-senior risk to create equity risk. The investment strategy is a buy-and-hold approach, with the aim of offering high returns to investors while keeping default risk limited. Investors are primarily exposed to rating migration risk, to m-t-m risk and, finally, to the capability of the external manager. The rating agencies assign, in general, an AAA rating to the business model of the CDPC, which is a bankruptcy remote vehicle (SPV). The business models of specific CDPCs are different from one another in terms of investments and thresholds given to the manager. The preferred asset classes in which CDPCs are invested are predominantly single name CDS,

bespoke synthetic tranches, ABS and all kinds of CDOs. So far, CDPCs' main investments are allocated to corporate credits, but CDPCs are extending their universe to ABS and CDO products, which provide further opportunities in an overall tight-spread environment. The implemented leverage provided by the vehicle can be in the range of 15–60-fold. On average, the target is typically around 15 per cent return on equity, paid in the form of dividends to shareholders.

In contrast to CDPCs, PCVs do not invest in the top of the capital structure, but in equity pieces (mostly CDO equity pieces). The leverage is not implemented in the vehicle itself as it is already given by the underlying instruments. PCVs are also set up as SPVs and listed on a stock exchange. They use the equity they receive from investors to purchase the assets, while the return on their investment is allocated to the shareholders via dividends. The target return amounts, in general, to around 10 per cent. The portfolio is managed by an external manager and is m-t-m. The share price of the company depends on the NAV of the portfolio and on the expected dividend payments.

The most famous vehicles over the past few months have been SIVs. In general, an SIV invests in the top of the capital structure of structured credits and ABS in line with CDPCs. In addition, SIVs also buy subordinated debt of financial institutions, and the portfolio is m-t-m. SIVs are leveraged credit investment companies. The vehicle typically issues investment-grade rated commercial paper, medium-term rate (MTNs) and capital notes to its investors. The leverage depends on the

character of the issued note and the underlying assets, ranging from 3–5 (bank loans) up to 14 (structured credits). These structures carry significant credit risk, including the risk of default. The SIV market has imploded recently, leading to the proposed bail-out via the super-SIV fund organised by the US Treasury and several major US investment banks.

These vehicles allow newcomers to

tap the structured credit market, obviously supporting the structural bid (spread positive). However, leverage is increasing steadily as all these companies implement leveraged strategies to generate sufficient return to justify themselves. This makes markets more vulnerable to exogenous shocks, especially as there is an overlap in investment strategies. This is exactly what was seen in 2007.

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