Regulating Complex Derivatives: Can the opaque be made transparent?*

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15 April 2010

Revised 10 June 2010 & 30 January 2011

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*To appear in the *Journal of Financial Regulation*, March 2011

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Regulating Complex Derivatives: Can the opaque be made transparent?

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Introduction

The response to the financial crisis of 2007-2009 has so far been largely concerned with proposals for sharpening the national and international regulatory framework, for example, by re-instating the US 1933 Glass-Steagall act (now called the "Volcker Rule"), restricting institutions like hedge funds and private equity firms and practices like short selling and credit default swap (CDS) trading, the US Dodd-Frank Act requiring exchange trading of complex derivatives like CDSs, or penalizing or increasing the regulatory capital requirements on financial institutions. But it may well be that the deregulation of the Thatcher and Reagan and their successors throughout the Greenspan years led to a situation that had less to do with Schumpeterian "creative destruction" than with the abuse of market power. In the words of Robert Khuzami, SEC Enforcement Director, regarding the recent civil fraud suit involving a subprime mortgage bond or collateralized debt obligation (CDO) brought against Goldman Sachs, "the product was new and complex but the deception and conflicts (of interest) are old and simple".

The exact role played by derivatives in the financial crisis is of course controversial.[2] However, derivative deals of many kinds have been associated with abuses that raise important regulatory issues. In a highly sophisticated industry such as

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[1] This paper has been presented at the Law Reform and Financial Markets W. G. Hart Legal Workshop at the Institute for Advanced Legal Studies of the University of London on 24th June 2009 and at the Münchner Kompetenz Zentrum Ethik Seminar of the Ludwig Maximilians Universität, Munich on 9th July 2009. We are grateful to the participants and the associate editor for helpful comments and criticism.

[2] See for example, *Henderson* (2009) 11 JIBFL 679.

modern investment banking, specific rules are only of limited use. Markets depend for their efficiency on flexibility. This suggests that future regulation must first get the underlying market and institutional structures right and then efficiency is best guaranteed not by regulatory interference in the detail of negotiations, but by applying the founding principles of commercial life. They are *caveat emptor*, the principle that it is always the buyer who is responsible for evaluating the terms of a deal offered to him, and good faith, the principle that contracts do not permit deliberate harm of one party by the other. Markets depend on these two principles being held in the right balance to one another and seen to be so held, which is probably impossible without supporting legislation. Ultimately, however, they are judicial principles. They are applied not by regulators, but by courts.

Be that as it may, many of the biggest market disturbances were obviously unleashed by mispriced credit derivatives (notably in the cases of Citgroup, Lehmans, Merrill Lynch, AIG and AMBAC). Credit default swaps (CDS) – in any event in their commercially *bona fide* form – are a form of insurance. The constraints normally applicable to insurance (in particular, that indemnification is restricted to "insurable interest", i.e. real loss) significantly limit the risks of the insurer. However, contracts for credit derivatives invariably specify that they are not insurance (and therefore outside the rules for that industry). This inevitably increases the risk of the party writing the CDS – to a massive degree, as is now evident. AIG, itself traditionally an insurer, appears not to have taken this into account in accumulating its own huge exposure to CDSs. At the very least, the speculative element of what is after all "fake" insurance needs to be adequately reflected in the price of the deal. Beyond that, perhaps disclaiming the "insurance" element in CDSs should be banned altogether. That would be an example of an abuse that may be amenable to regulatory reforms.

In this paper we examine the case for applying general principles to such instrument specific regulation. In the next section, we shall discuss the specific consequences for derivatives litigation of informational asymmetry arising from the market power of global investment banks. These insights are based on a large number of cases currently in progress involving major European and US financial institutions in the fields of fixed income, asset management and foreign exchange hedging as well as credit derivatives. To set the stage for the subsequent discussion, the representative instruments involved are described from the plaintiff's viewpoint in a general way in Section 3. In Section 4 we attempt to draw appropriate legal principles from these "failed" derivative deals and in Section 5 we turn to their regulatory implications and likely consequences. Section 6 concludes.

Informational Asymmetry

In a significant number of derivatives cases it is clear that the initiators of the over-the-counter (OTC), i.e. bespoke, deals have been able to take advantage of their contract partner's ignorance or inexperience. Indeed, it has been said in the City of London that "30% of OTC derivatives are bought and 70% are sold" meaning that 30% of the deals are between counterparties who are professionally able to assess the risks involved while 70% are sold by the issuer to a counterparty who has no idea in detail of what they are buying. Does the latter, in any particular case, exceed those limits set on *caveat emptor* by good faith? Under what circumstances is a participant in a sophisticated market entitled to assume that everyone understands what is going on?

Three kinds of ignorance or "informational failure" have played a role in dysfunctional derivative contracts in recent years, namely:

- commercial innocence
- documentary misunderstanding
- technical ignorance.

To some extent, each is involved in all the various disasters that have recently befallen incautious investors. However, each element raises slightly different legal issues and we shall consider them separately.

Commercial innocence

Commercial innocence sounds like the kind of element that a mature market should *not* have to accommodate. Nonetheless it has clearly played a major role in the context of the rapid development of the financial markets over the last half century. The most important change has been to remove, as far as possible, questions of capacity to contract from the functioning of the markets.

All markets are dangerous places for the uninitiated, and this is particularly true of the financial markets. Under German law, for example, access to derivatives trading was long restricted to persons qualified, for example by virtue of their status as "Kaufmann" (i.e. commercial trader, see § 53 of the Stock Exchange Act of 1908)[3].

[3] H.-D. Assmann, R. Schütze (2007), *Handbuch des Kapitalanlagerechts*, 3rd Ed., München: Beck, p. 6

However, restricting entry is alien to modern conceptions of market freedom. MiFID, which sets the terms of participation in European financial markets, represents the current high point in opening them up. Participants are still categorised in terms of capacity to contract – retail, professional, eligible counterparty – but these categories are negotiable in any particular case, and even at the most protected level (retail customers) the duties of care are now relatively abstract.[4]

Whatever the merits or demerits of this development – and in most Member States of the EU the regulatory bodies still closely supervise at least the retail markets – there has been a marked change in the attitude of banks to their customers. Whereas in the past bank managers fell into the same category as solicitors or doctors – they were professionals charged with duties of loyalty and personal responsibility[5] – this has now given way to a relationship in which bank staff are under the same pressures as any other salesman. It has taken a little time for popular perceptions to catch up with this, and only now, after the mayhem wrought by the financial crisis, has it become widely apparent that banks should be entered with the same degree of caution as used car showrooms.

The change of the banking business model has posed problems for customers who were previously not accustomed to scrutinising offers from their bank in much detail. This is particularly true of municipalities, who throughout the world suffer from not having the cash for high-class staff in their treasurers' departments. The fact that they are also solid credit risks makes them especially attractive to predators from new-style banks. The consequences of this combination of characteristics have been visible

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4 H.-D. Assmann, U. Schneider (2009), *WpHG - Wertpapierhandelsgesetz*, 5th Ed, Cologne: O. Schmidt, § 31a.

5 In Germany bank employees were called “Bankbeamte”, which put them on a level with civil servants.

in a series of cases, ranging from classics like the *Hammersmith*[6] case and *Orange County* to more recent contretemps such as *Kenosha USD v Royal Bank of Canada*[7], and *Stadt Hagen v Deutsche Bank*[8]. The latter is only one of a series of disputes between municipalities and banks that have been exercising the German courts. Similar disagreements about structured derivatives have recently surfaced in relation to municipalities or public bodies in Greece and Italy, including the current pressing of criminal fraud charges against several global banks on behalf of the City of Milan involving swaps of the type discussed in the next section.[9] Such controversies have also arisen in America where the sums involved are even higher and threaten to bankrupt municipalities such as Detroit[10].

Legal misunderstanding

The second category of problems is that of *legal misunderstanding*. By this we mean a failure to understand the legal import of an agreement.

It is a feature of some modern derivatives that the documentation is extremely voluminous. Early, and now notorious, examples of this were the so-called "cross-border-leasing" deals struck by numerous municipalities and utilities in the late nineties. Despite their name, many of these were in reality a combination of tax shelter and credit default swap. In exchange for a payment of several millions, municipalities would agree to "sell" capital items to US investors and then to lease them back for a certain period.

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6 [1991] 1 All ER 545.
7 [2009] EWHC 2227 (Comm).
8 LG Wuppertal 16.07.2008.
9 E. Martinelli. Milan swaps banks failed to shop around, witness says. Bloomberg News, 11 November 2010. Available at: www.bloomberg.com/news.
10 T. Francis, B. Levisohn, C. Palmieri and J. Silver-Greenberg. Wall Street vs. America, *Business Week*, 20 November 2009, pp. 34-39.

The deals were structured so that only a relatively small amount of money genuinely changed hands, and all the incidents of ownership remained where they were, i.e. with the municipalities. The arrangement was allegedly intended to provide US investors with a tax shelter, though this is doubtful, since the IRS had already declined the model well before many of the deals were concluded. In fact, hidden among dozens of interlinked agreements and sub-agreements covering well in excess of 1000 pages was a credit default swap written on either AIG, AMBAC or another US insurer. Many of these deals duly blew up in 2008, to the dismay of the municipalities who had bought the "leasing" agreements. So far, at least, this aspect has only been substantively litigated in the US[11], but the issue has involved numerous European municipalities.[12]

Technical misunderstanding

The third category is *technical misunderstanding*. The principal example of this lies in the valuation of the performance to which each party commits itself. Banks do not gamble, or at least they should not. Not only that: they are obliged by law to keep a close watch on the value of the assets and obligations they hold on their books.

Techniques for valuing structured products have developed in the last thirty years or so, and it is only to that degree that banks have been able to start trading them. This applies especially to exotic products – i.e. structured instruments which can only be valued in terms of the parameters of a statistical distribution. Creating a model to value such an instrument is generally outside the competence of anyone who is not a financial mathematician (or "Quant"). Even though it is possible nowadays to obtain values for exotic products from specialist suppliers, and this method is frequently used

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11 *Hoosier Energy v John Hancock*, Southern District of Indiana, 25.11.2008 – 1:08-cv-1560-DFH-DML.

12 See for example, *AWG Leasing Trust v United States of America*, Northern District of Ohio, 28.05.2008 – 1:07-CV-857.

by traders, such information is too expensive to be used by client counterparties to a bank's offered product.

More to the point – quite apart from the problem of knowing where to go for information, or having the money to pay for it – most people who are not themselves regularly trading in the markets do not even know what it means to value something in terms of statistical parameters like "mean" or "standard deviation". "Price" in traditional parlance derives from the record of a concrete agreement reached in a liquid market between a willing buyer and a willing seller. By contrast, a statistical distribution generated from a computer simulation *seems* to bear more relation to a forecast than to an empirical fact. A statistical distribution, however, is typically required to specify the value/price of an instrument in relation to its opposing forward income streams. A "fair market value" will be the mean of such a distribution after adjustment for risk. With or without this adjustment the distribution's variance will give a measure of how risky it would be to rely on one outcome as opposed to another and, as we shall see in Section 3, other simple measures may be more appropriate. All such ideas are extremely useful, and can no more be dismissed as mere "forecasting" than the statement that the chance of throwing a four on a single throw of a die is one in six. Establishing regularity in terms of probability has nothing unfamiliar about it to particle physicists. (a typical source of "Quants"[13]). These techniques do not, however, *record* "a price", and to anyone operating within a deterministic world view their entire conceptual basis remains essentially foreign.

Ignorance of statistical pricing methods and of how they underlie derivative trading values has exposed numerous town hall treasurers to some highly unfavourable deals. Instruments which were variously presented as "techniques for optimising interest

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[13] R. R. Lindsey, B. Schachter (2007), *How I became a quant, Insights from 25 of Wall Street's elite*, Hoboken, NJ, p. 58.

rate payments" and "modern debt management" were, in fact, no more than badly priced wagers on the yield curve. Losses were considerable (the German city of Hagen, for example, ended up €47M under water on its rates deal with Deutsche Bank, LG Wuppertal 16.07.2008, and the current Milan case involves alleged total losses of €101M).

A worrying aspect of these cases, of which there were many, was the evasive representation of valuation and risk. In the out-turn – for example, when calling the instrument – the banks made it clear that they were using statistical techniques to set prices. Giving evidence in court they explained that they bargained for the deal by first obtaining a fair market value from statistical models and then moving the strike (i.e. essentially the line dividing the two parties' expected returns) as far in their favour as the customer would tolerate.[14] It was accepted by defendant banks that the "profit margin" envisaged by this technique was in the region of 5 % of nominal (though "nominal" is an abstract magnitude given the considerable leverage structured into the products)[15]. When asked how the customer was supposed to bargain without knowing the fair market price, or even that such a thing existed, the witness in the Stuttgart case indicated that customers could always ask for terms from other banks. This was obviously a rather theoretical possibility, however, not least in view of the fact that the products were individually customized ("OTC").

In relation to risk, obscuring the basis for valuation was almost a systematic part of the sales information. In their term sheets, banks emphasised that risk and return were not amenable to certain forms of valuation. They said, for example, that writers of options (most of the disputed rate swaps involved the customer writing an option) were

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14 OLG Stuttgart 9 U 111/08 (settlement protocol). See also OLG Stuttgart, 9 U 164/08 and OLG Stuttgart 9 U 148/08.

15 LG Frankfurt/M 10.03.2008 – 2-4 O 388/06.

exposed to “theoretically infinite” risk. They also claimed that a “worst case” could not be quantified.

Whether or not these comments constitute fair warning, they certainly obscure the reality of the instruments from the professional traders' point of view. The suggestion – frequently made by the banks' representatives in court – was that rate swaps were entirely unpredictable and the bank had nothing more reliable to go on than the customer. This is, of course, wrong! Nobody has a deterministic forecast for future interest rate developments. It is quite true that anything might happen. But it is not true that all outcomes are equally probable. And the financial markets price probabilistically, not deterministically (more on this in Section 3).

So statistically speaking, deterministic concepts like “theoretical” risk and maximal “worst case” are not relevant. Statistical pricing quantifies the relative probability of various outcomes so that, given a distribution, an investor can decide, for example, whether the possible return is worth the risk, whether a hedge is required, and so on. The banks had access to computer generated statistical distributions because without them they would not have been able to establish the products' fair market values. And they needed to quantify the risk in order to manage the client credit risk as well as their own market risk. In view of this knowledge, which would have been available to the bank in (for example) quantified value at risk (“VaR”) figures, telling the client that her risk was “theoretically infinite” sounds like deliberately pointing someone in the wrong direction.

Cumulative misunderstanding

The most striking calamities have, as widely reported in the press, taken place in the area of collateralised debt obligations (CDOs). Here too there have been celebrated victims among public bodies, for example the Austrian state railways and the local transport system in Berlin, who together seem to have accumulated losses approaching € 1 B. Disasters of this kind are probably only explicable in terms of all three forms of informational imbalance coming together.

As is now generally known, CDOs serve to set exposure (risk and return) in line with the preferences of investors. They do this by channeling the risks arising from a portfolio of securities. Instead of sharing risk out evenly among a portfolio's investors (everyone takes a *pro rata* share of losses), losses flow sequentially to a hierarchy of "tranches". The lowest tranche takes losses first. If losses are so great that this one gets knocked out, the next tranche up gets attacked. In compensation for this, investors in the lower tranches reap a correspondingly higher rate of return, at least for as long as each tranche still exists – and so on up the hierarchy.

The CDOs which caused so much damage to European institutional investors were synthetic and structured around credit default swaps (CDSs). This means that the portfolio did not consist of actually owned obligations, but are better compared with a group of race horses on which the investors bet. Misfortunes befalling the obligations, such as default, restructuring and the like (these are called "credit events") trigger certain previously agreed consequences for the CDS counterparty, and these losses then flow into the CDO itself. A portfolio which escapes "credit events" during the lifetime of the note may be compared to having all one's horses complete the season unscathed.

Obviously such a result would be highly desirable for those holding the "lower" tranches.

As with interest rate swaps, modern financial mathematics makes it possible to calculate the risk adjusted net present value and the risk profile of each tranche.[16] For the prudent investor, doing this should really precede engagement at any particular level. Such a procedure is, as with interest rate swaps, not easy for anyone outside the markets, because it requires access to credit risk data for all obligations in the portfolio. Such data is expensive and in any event the mathematical challenge remains.

One example of a CDO which was bought by German public bodies in the early summer of 2007, and which subsequently nosedived, were the Volante CDO Class A2E Credit linked notes issued by Barclays Capital with a total volume of € 100 M for listing on the Dublin Stock Exchange. The instrument was sold with an "expected" S&P rating of AA and paid out 0.78 % over Euribor. By September 2009 it was rated at CCC-.

From the start, it had three features which perhaps give pause for thought. First, the tranche was only 1 % thick. The problem with such a thin tranche is that it can be wiped out by a correspondingly small incidence of losses in the portfolio.

Second, at 5.44 % to 6.44 % it was deeply subordinated. That is to say it was low down in the hierarchy – not quite first loss, but not far away from first loss, and thus exposed to attack after even a relatively small number of defaults in the reference portfolio. The reference portfolio consisted of 100 obligations, all roughly equal in weighting. This

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16 See e.g. M.A.H. Dempster, E.A. Medova & M. Villaverde (2010), 'Long-term interest rates and consol bond valuation', *Journal of Asset Management*, 11.2-3, pp. 113-135.

meant that the Volante notes could be under water even if only seven of the one hundred reference obligations generated “credit events”.

The third feature was less visible from the prospectus, but lay concealed in the indicative portfolio. The portfolio consisted, at first glance, of securities from worthy issuers including Allianz, AT&T, Berkshire Hathaway, Deutsche Telekom and others. Also present, however, were the names Countrywide, Fannie May, GMAC LLC, Lehman Brothers, HSBC Finance, Merrill Lynch, Residential Capital, and Bear Stearns. By 8 June 2007, when the product was offered to investors, the sub-prime crisis had already been gathering momentum for four months, and the press had reported negatively about all eight of these names. A further ten names in the portfolio were in sub-prime trouble by the end of the year: AMBAC, Capital One, Centex, CIT, Freddie Mac, Financial Security Assurance, MBIA, MGIC, PMI, and XL Capital.

In view of this, it is hardly surprising that the Volante A2E notes are now largely worthless. Eight of the 100 portfolio names were known to be risky even when the product was sold; but by six months later, 18 fell into this category. A slender tranche at 5.44 % - 6.44 % was clearly in massive danger from the start.

It is not unknown for CDO investors to criticise the *composition* of portfolios which have led to losses. This generally relates to substitutions made during the term of the note by the portfolio manager.[17] The Volante A2E portfolio is managed, but that does not seem to be the problem: the constituents of the portfolio were “toxic” from the start. Why this should have been so may have something to do with Barclays' alleged $

[17] See *HSH Nordbank v UBS* ([2008] EWHC 1529 (Comm)) and HSH’s earlier dispute with Barclays (Jill Treanor, “Barclays ‘toxic waste’ row with German bank settled”, The Guardian, 15.02.2005, and more recently, P.Aldrick, Suspicions grow over Barclays toxic debt move, The Telegraph, 12.01.2011).

9 B exposure in the subprime market.[18] The question for us in Section 4, however, is what legal consequences, if any, such a dramatic miscalculation should have for the parties – that is, for the German institutions which bought Volante on the one hand, and for Volante's seller on the other. But first we will discuss losing structured derivative deals for banks' clients in fixed income, portfolio management and FX.

This section attempts to illustrate the issues raised in the previous section in terms of various representative OTC structured derivatives sold to clients by banks in the 2004-2006 boom period with maturities ranging from three years to indefinite-lived consol bonds. The clients investing in these products were wealthy individuals, SME's and local authorities in Continental Europe. The contracts between counterparties involved structured versions of swaps, bonds raising Tier 1 capital for financial institutions under Basel II and foreign exchange (FX) hedging programmes. Representation to clients of the risks involved in these investments was typically termed "unlimited", as noted above, and/or ignored egregious features of the contracts such as embedded one-sided cancellation options without compensation.

Some Representative Structured Derivative Deals

Structured swaps

A *par interest rate swap* is a standard contract between two counterparties to exchange cash flows. At set time intervals termed *reset dates* one party pays a predetermined *fixed* rate of interest on the *nominal* value, the other a *floating* rate, until the *maturity* date of the contract. The floating leg of swap fixes the interest rates for each payment at the rate of a published interest rate. The fixed rate, known as the *swap rate*, is that interest rate

[18] Anuj Gangahar, "Fortress unit moves to cut subprime links", Financial Times, 25.09.2007.

which makes the fair value of the par swap 0 at inception. Thus the cash flows of the two legs of a par swap are those of a pair of bonds with face value the swap nominal, one fixed rate, and the other floating rate.

Since the swap market is highly liquid with many par swaps traded every day, it is possible to obtain rates for swaps of a set of *constant* maturities from 1 to 30 years from the market each day.[19] From the market swap rates a swap curve which gives the rates for constant maturity swaps (CMS) of *all* durations may be constructed each day. This market determined curve may be used to price OTC swaps between a dealer and specific client counterparty. Illustrative swap curve movements over time are depicted

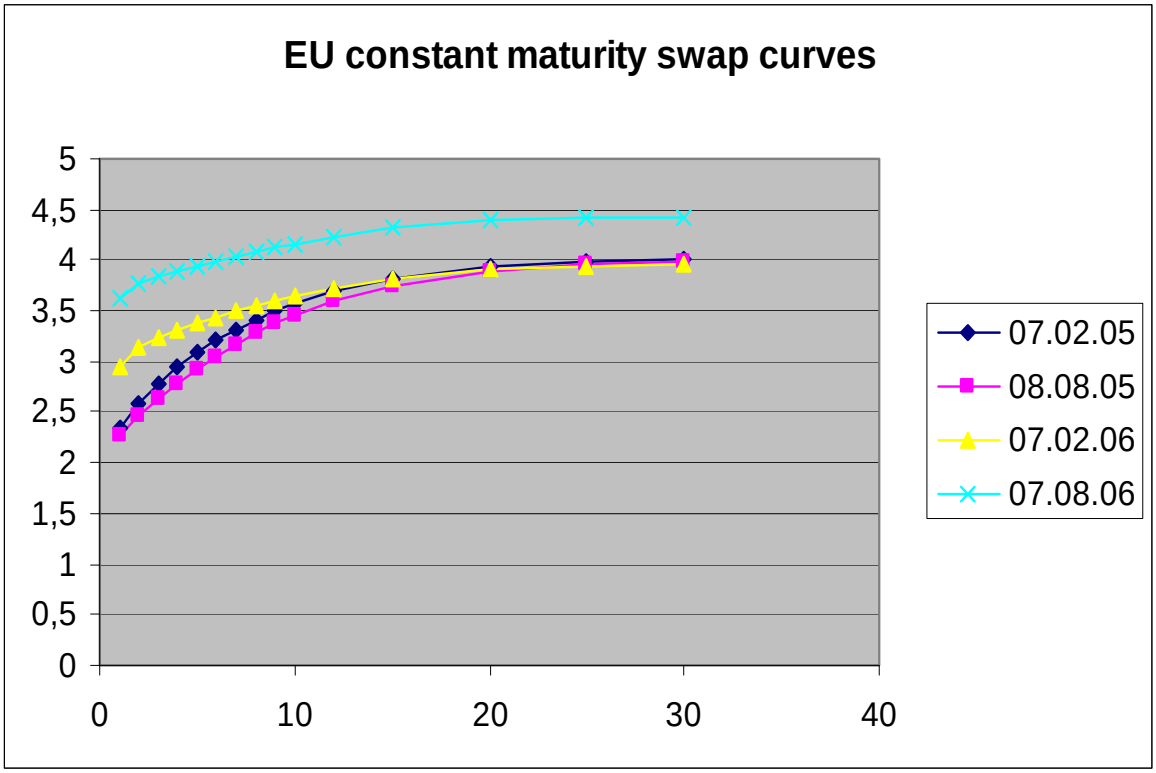

Figure 1 Illustrative swap curve movements

[19] This is by contrast with the market yields for Treasury bonds whose actual maturities each day depend on a discrete number of previous auction dates and must be adjusted to approximate constant maturity.

in Figure 1.

A standard corporate treasury hedging situation for such an OTC swap is that the client, rather than the bank, pays fixed and receives floating to cover floating rate loan payments on a principal amount, matched by the swap nominal, in order to hedge floating interest rate risk. However, in most of the CMS-spread ladder swaps issued to clients the bank pays fixed and *receives* floating.[20] These payments are illustrated for a representative CMS swap in the conventional way in Figure 2 which shows the typical few (here two) initial fixed payment exchanges in the client's favour. These are typically followed by structured floating payments whose precise details need not concern us here except to note that at each payment date the spread shown in Figure 2 depends on the swap rates at different maturities and the strike and the gearing (here 3) are chosen by the bank to structure the product. The term *ladder* refers to the fact that at each payment period a term depending on these parameters and the current market spread is added to or subtracted from the interest payment of the previous period. We shall see that this can lead to an alarming rate of increase in the client's payments to the bank which is paying *fixed* payments to the client.

[20] Usually a swap rate from Reuters with resets at 3 or 6 month intervals.

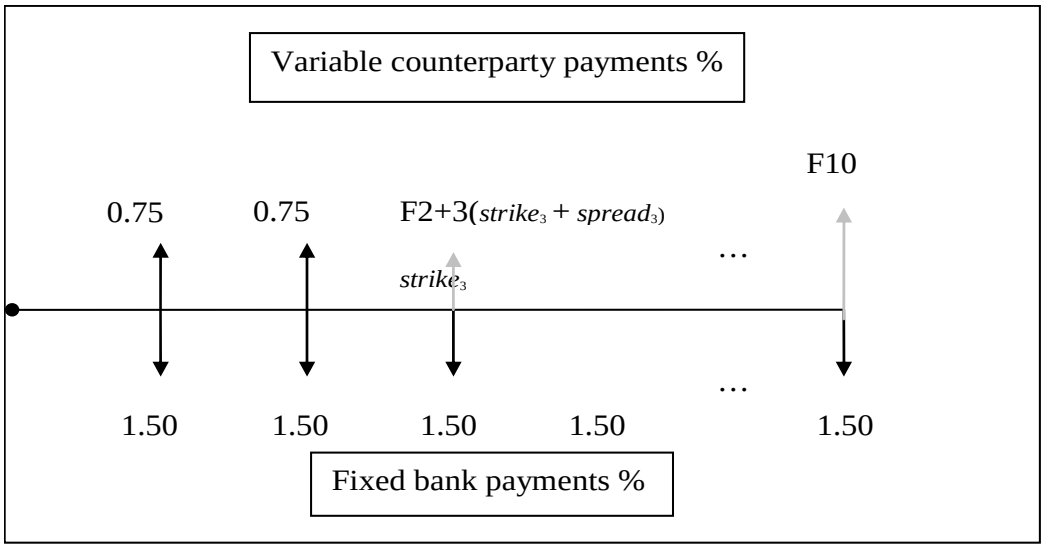

Figure 2 CMS swap payment illustration

Suffice it to say here for our purposes that it is possible with a suitable mathematical model to conduct a Monte Carlo simulation for possible swap forward cash flows to maturity which upon time (and possibly risk) discounting yields a *net present value* (NPV) distribution for the security as illustrated in Figure 3.[21] The expected value of this distribution with risk discounting is the so-called fair market *price* of the security; without risk discounting the distribution corresponds to the ordinary NPV values used by corporate treasurers and illustrates the *relative* likelihoods (probabilities) of the NPVs of possible future cash flows.

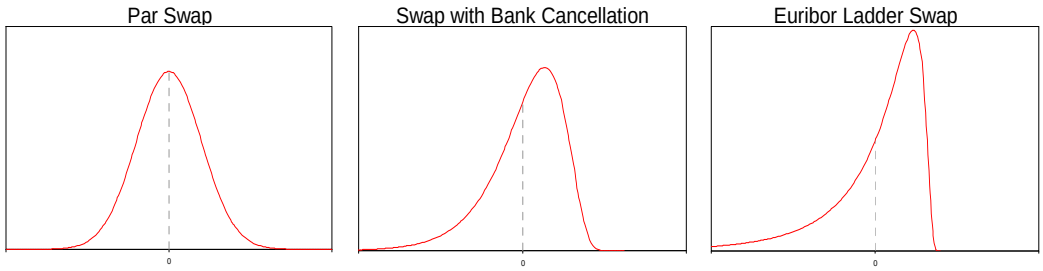

Figure 3 NPV distributions of three types of swaps

21 For more details and further references see M.A.H. Dempster, E.A. Medova & M Villaverde, supra note 16.

The NPV distribution on the left is that of an exchange traded par swap which has a symmetric NPV distribution about zero after transaction costs. That in the middle shows the effect of the OTC swap client granting the bank an option to cancel without compensation in the contract which skews the losses in favour of the bank. The rightmost diagram gives an indication of how much this skew is further moved against the client and in favour of the bank by adding the structured CMS-spread ladder feature to the client's floating payment[22].

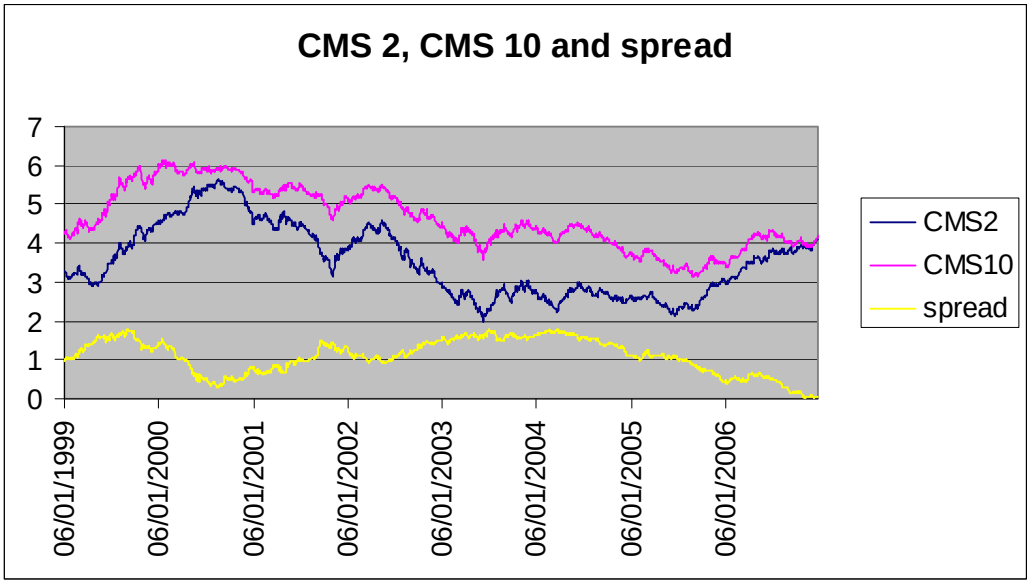

Figure 4 Base CMS rates and spread evolution 1999-2006

In essence, due to the structuring of the swaps in the 2005-2006 issuing period, the counterparty gave the dealer a call option on the flattening of the swap curve shown in Figure 2 which normally follows sharp rises in short term rates. Global macroeconomic conditions in the period that these contracts were issued clearly indicated sharply

[22] We shall see a number of these Monte Carlo NPV distributions for actual instruments in the sequel.

increasing short rates, a process that had already begun in the US at the time and followed in the EU only shortly thereafter. Figure 4 shows the declining CMS 2-10 year spread since the inception of the euro to the end of 2006. The levered laddered payment formulae used to calculate a client's interest payment in CMS-spread ladder swaps issued in this period had the same intent as the infamous 'inverse floating' floating notes issued by Orange County, California to Merrill Lynch in 1994 and lead to its bankruptcy. The 'laddered' dependence of the current client payment on the previous for the more recent CMS-spread ladder swaps have however an additional acceleration effect not present in inverse floaters.

The typical effects of this structuring in steadily increasing net client payments forecast for valuation purposes (as described above) at inception can be seen in Figure 5, which shows the expected payments and those at plus or minus one standard deviation from the mean of their forecast distribution in per cent of nominal for a specific swap. Even though a positive net payment stream in favour of the client is possible, it is capped a relative low value by a floor in favour of the issuer. In the vast majority of cases, when such valuation forecasts were conducted after several floating payments by the client had actually been made to the bank, their realized values fell close to the negative red line. In short, the declining spread increased client payments substantially.

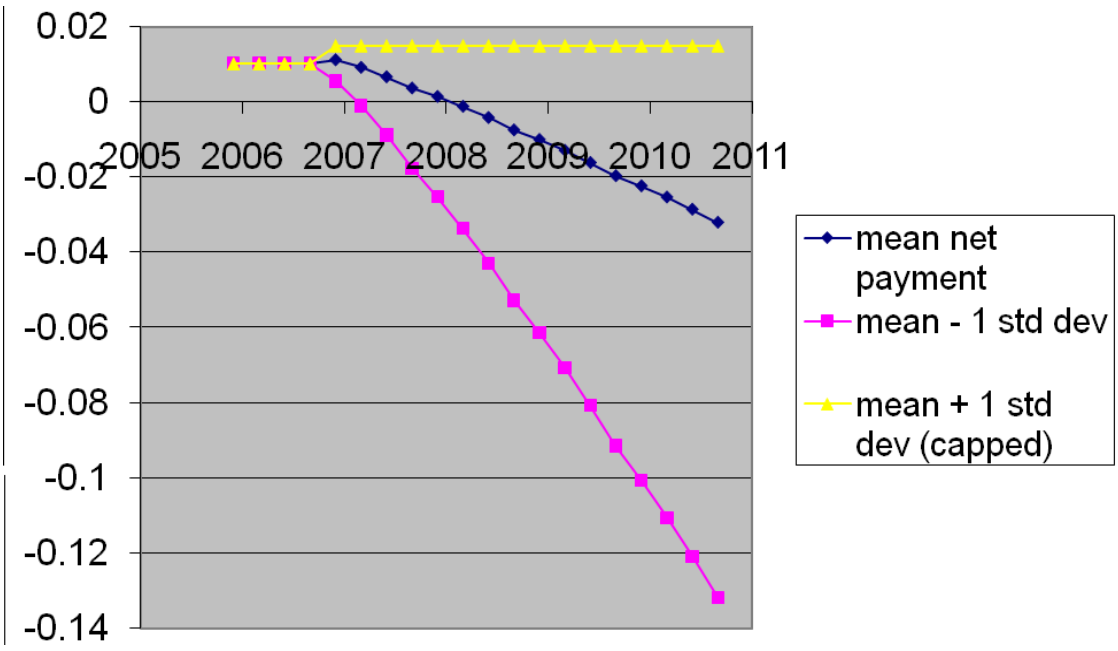

Figure 5 View of client net payments distribution at inception

The potential results of this at inception in terms of the NPV of simulated future cash flows distribution are shown in Figure 6 where both the distribution with and without the bank's cancellation without compensation option are shown. Note that the bank's cancellation option cuts off most of the client's upside (above 0) and skews the client's potential loss tail at the 99% level far to the left while making the bank's corresponding loss level asymmetrically much smaller.

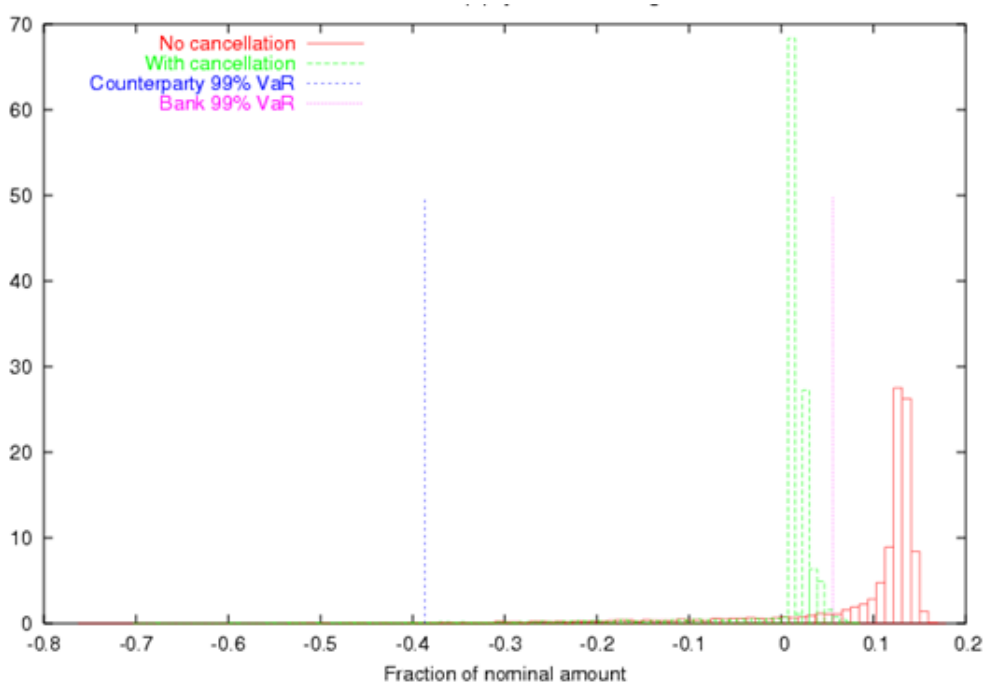

Figure 6 Distribution at inception of total net time discounted swap payments to client in percent of nominal with 99% loss level (value at risk) from 0 to client and bank

Figure 7 shows that over time (here one year) this net NPV distribution typically just gets worse (even though here the 99% loss level remains approximately the same).

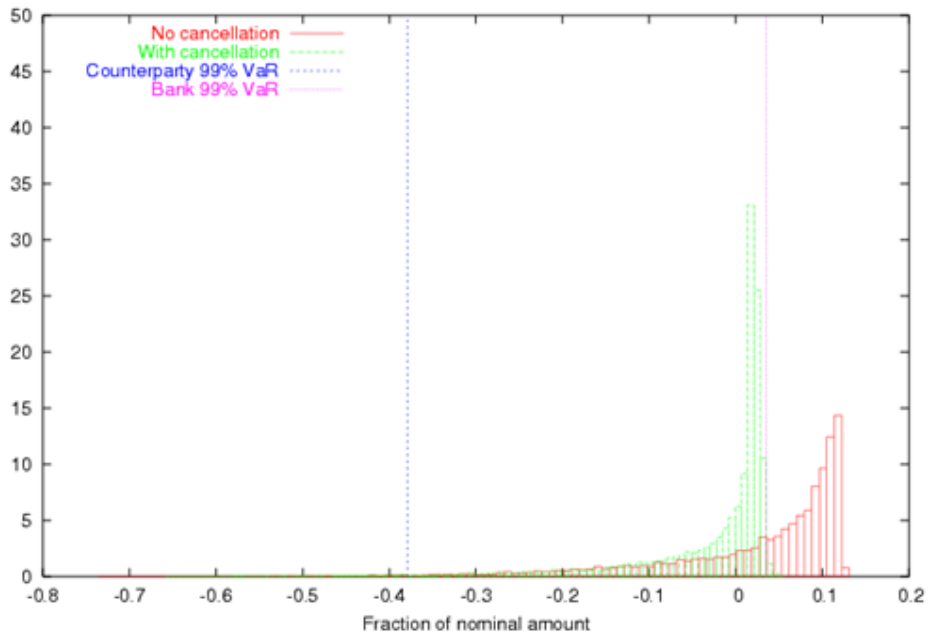

Figure 7 Distribution at first anniversary of total net time discounted swap payments to client in percent of nominal with 99% loss level (value at risk) from 0 to client and bank

Capital raising hybrid bonds

Under the Basel II recommendations it became possible for banks to raise Tier 1 regulatory capital in the form of so-called hybrid instruments issued as bonds or notes but ranking in default seniority at the level of preferred shares. Most European banks, including the European Bank for Reconstruction and Development (EBRD), used the structuring techniques we have seen above applied to OTC swaps to issue callable bonds of finite or infinite maturities. As before these typically had the sweetening feature of a few fixed payments at higher than current market rate followed by floating payments by the bank which sank well below expected market rates represented by the current forward interest ratecurve.

Figure 8 shows this feature of annual coupon payments for a 30 year bond only callable at two specific dates in the future. For this bond three annual coupon payments were at 6%, triple the prevailing market rate (see Figure 14), followed prospectively at inception by a rapidly coupon rate distribution, which was however floored at 3% per annum. Many such instruments, including those issued by the EBRD, were however not floored. Figure 9 shows the features of the prospective semi-annual coupon payment distributions for a 20 year maturity bond (callable at floating rate payment dates) which at inception has a significant probability of paying the holder no interest at all after 10 years.

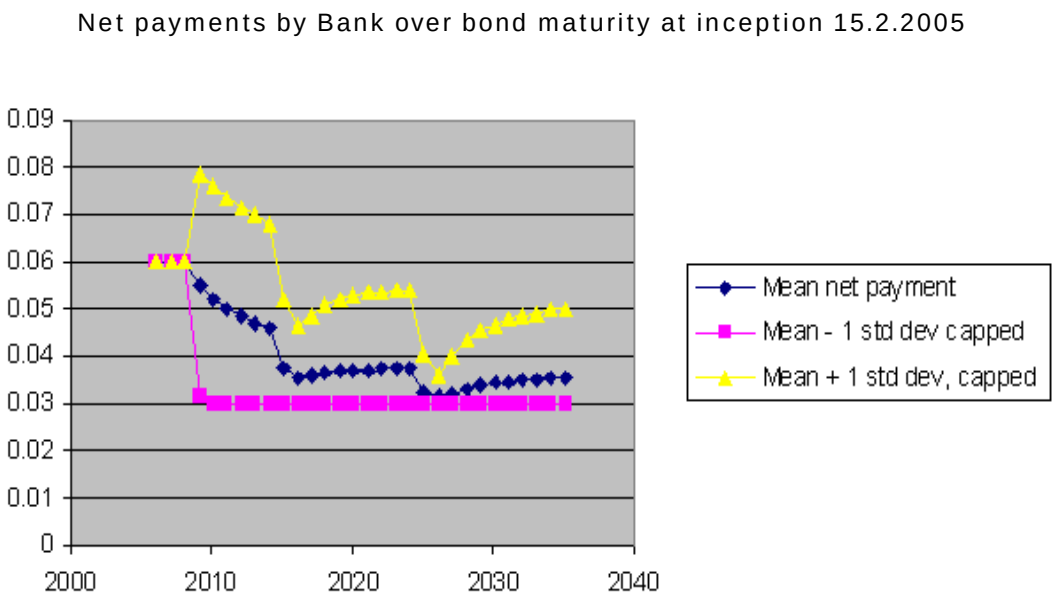

Figure 8 Prospective annual coupon payments at inception for a 30 year structured bond with coupon floor at 3%

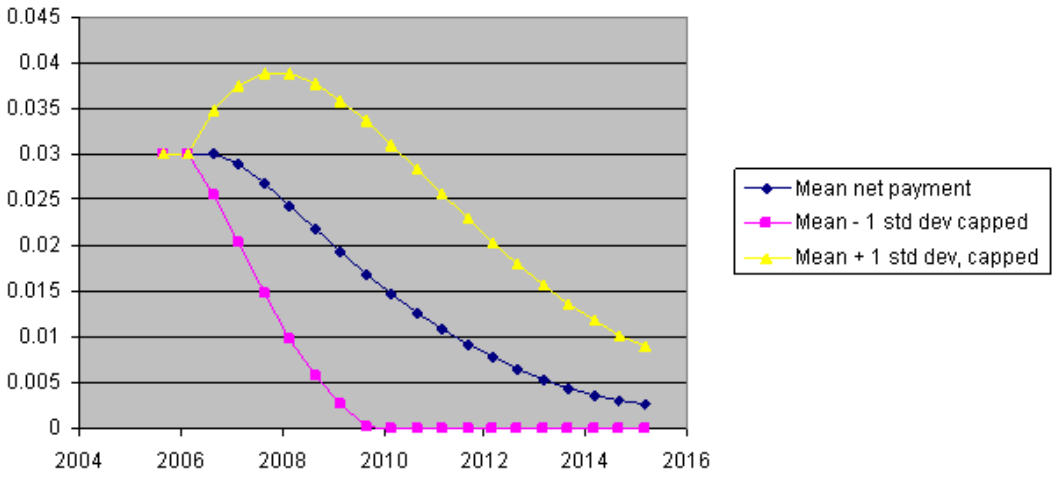

Figure 9 Prospective semi-annual coupon payments at inception for a 20 year structured bond with no coupon floor

Figure 10 shows for a hybrid instrument issued by another bank early in 2005 the prospective distribution at inception of the NPV of future coupon payments plus the final repayment of the invested capital as a fraction of this investment. Thus the value 1 represents the repayment by the bank to the bond holder of exactly the intitial investment effectively *without* any interest but only the capital appreciation which would accrue to the holder of a zero coupon bond due to the time value of money.[23] Outcomes below one represent loss of capital invested and outcomes above one represent the collection of some interest by the investor, taking account of the bank exercising its call option when market conditions lead to coupon payments become too high.

[23] An alternative representation would be to show the present value of the net gain over the initial investment of the bond holder as a percentage of nominal by subtracting it from the PV of the subsequent cash flows. This would produce NPV distribution diagrams comparable to those for swaps in which 0 rather than 1 becomes the pivotal value between client gains and losses. We are indebted to Professor Robert R Bliss for this observation.

Figure 10 shows that due to the structured coupon payments the prospective situation nearly four years later in late 2008 the situation has become much worse for the holder of this bond – the investment will be almost certainly loss making!

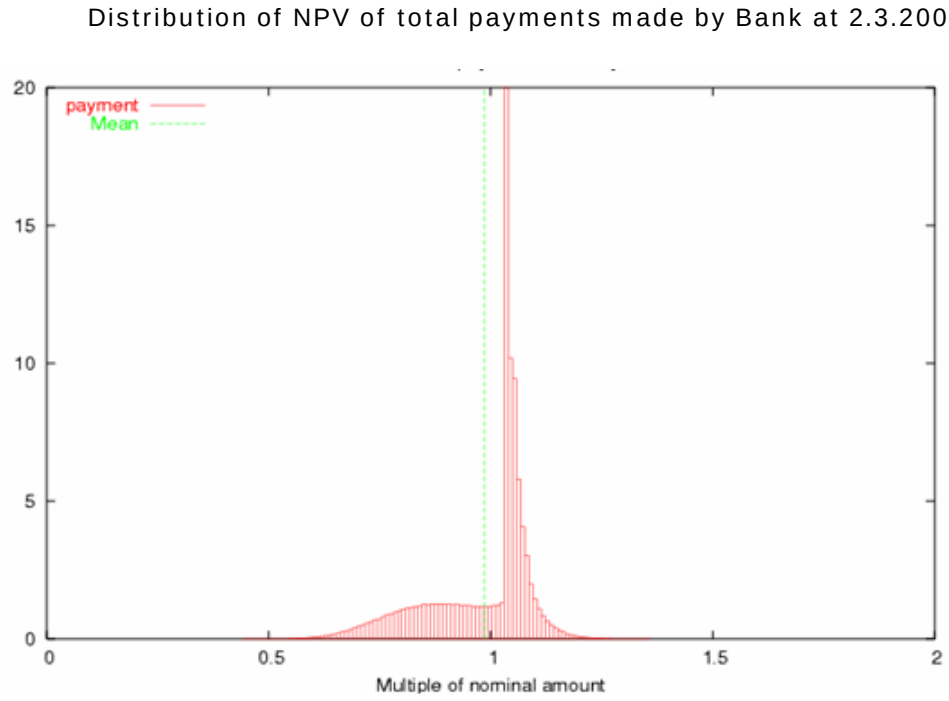

Figure 10 Prospective distribution at inception of the present value of future payments of the bank to the hybrid bond holder showing possible return on investment

As a demonstration of the conflicts of interest inherent in modern banking institutions their asset management divisions recommended to private pension funds and other risk averse investors portfolios of these loss making hybrid capital raising "bond" instruments issued by other banks, sometimes even including those issued by the investment banking arm of the portfolio managers bank.

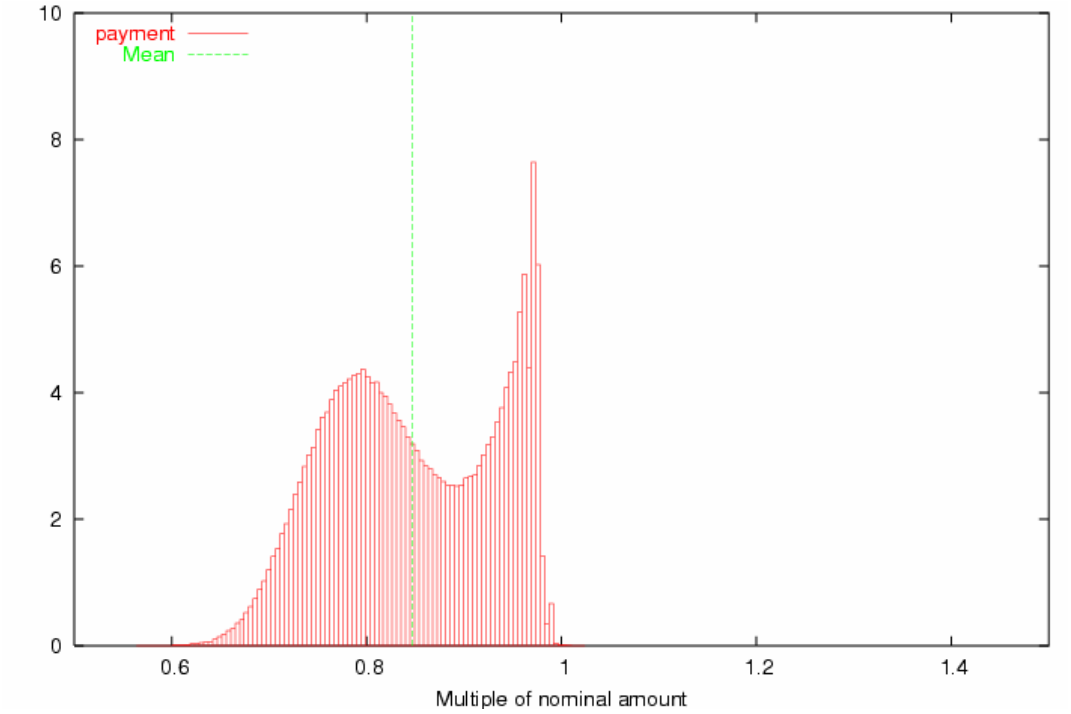

Figure 11 Losing prospective distribution of the present value of future payments of the bank to the bond holder nearly four years from inception

Subsequently, in 2007, banks extended the maturity of callable hybrid capital raising instruments to indefinite, thereby reviving a structured floating rate version of the *consol* fixed rate bonds issued by the British government in the eighteenth century and still alive today (with reduced rates). Such floating rate consols raise the issue of the not inconsiderable credit risk of the issuing bank defaulting on the interest payments over the potentially infinite maturity, however structured, and are very difficult to price.[24] Put simply, the issuing bank collects the invested capital up front for these bonds in return for a stream of interest payments terminated only by the bank calling the instrument and repaying its face value in extremely adverse market conditions or

[24] See for details, M.A.H. Dempster, E.A. Medova & M. Villaverde, supra note 16; We were unable to find any literature whatsoever on pricing floating rate consol bonds and had to devise appropriate techniques to approximately price these instruments taking into account all risk factors including default risk.

defaulting – think of the holders of the Russian Tsar's consols in 1917.[25] Interestingly, at inception, just prior to the credit crisis, these instruments were traded in the secondary market near par, as holders appeared to take the view that the bank would likely call these potentially infinite-lived bonds soon after the initial favourable fixed payments. With the manifold problems of the credit crisis, not least the insolvency and government rescue of many of the issuers, some of whom have suspended interest payments, these losing hybrid investments are currently trading at discounts ranging from 20 to 80% of face value. Figure 12 shows the present value distribution at inception of future

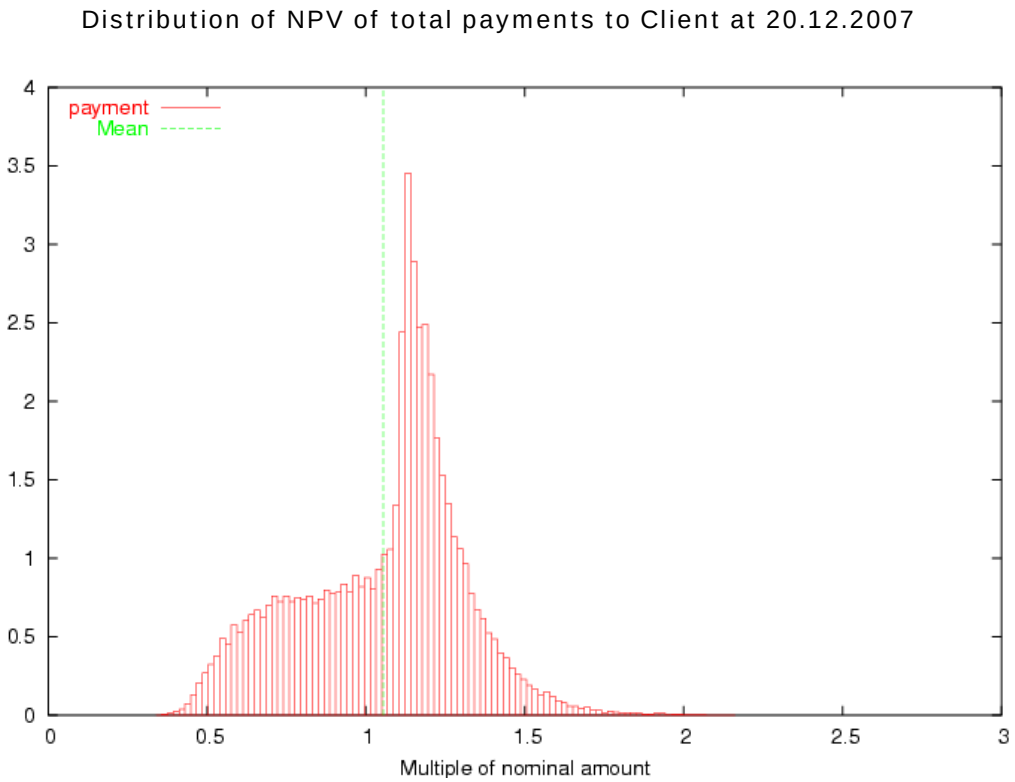

Figure 12 Prospective distribution at inception of the present value of future payments of the bank to the callable consol bond holder showing possible return on investment

[25] Some of whose descendants are still trying to make the current Russian government honour the debt.

payments to the bond holder of such an investment which has a high return tail in the relatively unlikely event of coupon payments continuing over a very long period. To evaluate such an investment in the absence of credit risk this PV payment distribution must be compared to that for a fixed rate long maturity sovereign or consol with the same face value, usually unfavourably.

Foreign exchange hedging

One of the most egregious failed derivatives deals we have seen to date involved a bank's European corporate client with needs to continually purchase US dollars for Euros and led eventually to over a 30M euro loss. The firm had previously been using forward contracts to do this in line with its anticipated needs, but the bank suggested that this could be more cheaply done using foreign exchange (FX) options to hedge its exchange rate risk.

Figure 13 charts the evolution since the introduction of the euro of the EUR-USD exchange rate, giving the value in dollars of one euro. After a short initial weakening period the euro's value enjoyed a steady rise in value from 2001 through the third quarter of 2008.

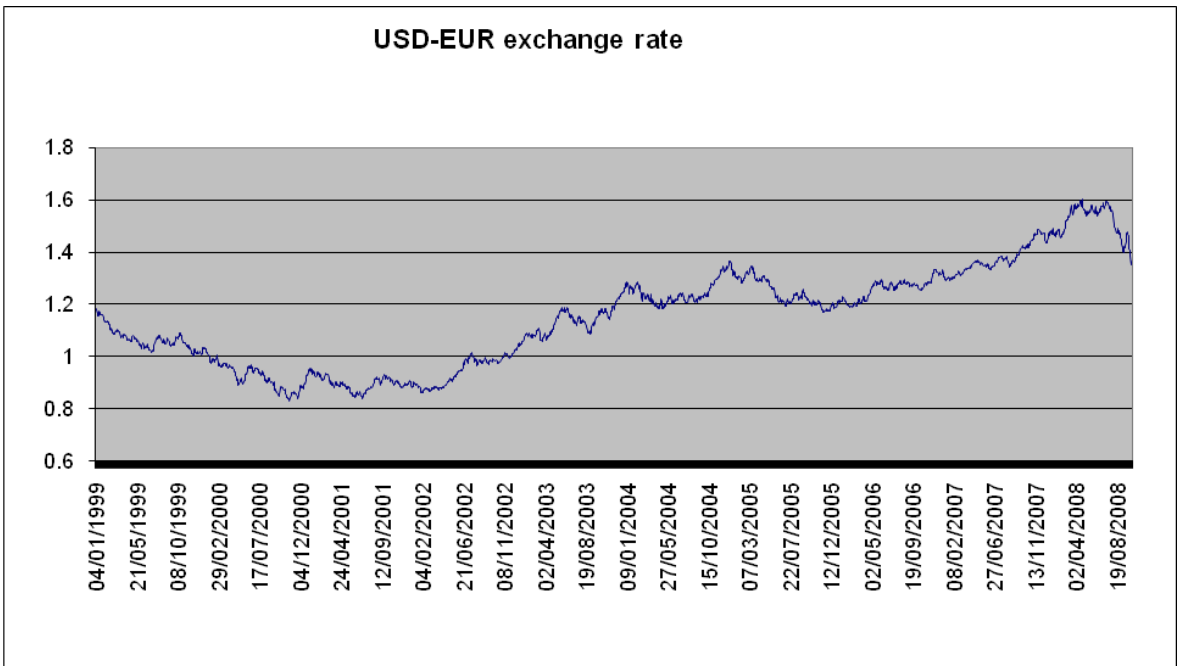

Figure 13 Evolution of the EUR-USD currency exchange rate from 1999 to 2008

According to the theory of uncovered interest rate parity the FX rates between two specific currencies responds to short term interest rates in the two currency areas. However Figure 14, which plots the US and EU London interbank offer (LIBOR) 1 month rates suggests that relationship for EUR-USD is at best complicated and at worst entirely unpredictable.

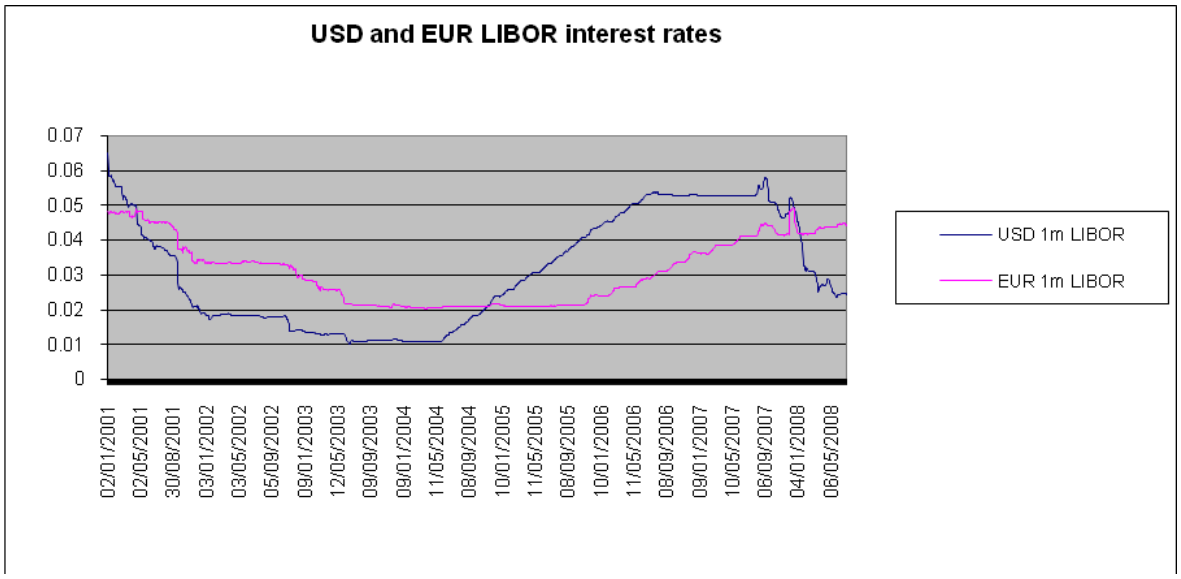

Figure 14 Evolution of USD and EUR LIBOR 1 month interest rates from 2001 to 2008

When the corporate client was initially presented by the bank with a standard FX hedging program it likely considered the costs too high relative to forward dollar purchase at no up front cost. The bank therefore came up with a deal to exchange at no up front cost European (i.e. exercisable only at maturity) FX barrier options whose payoff diagram in US dollars is shown in Figure 15.[26] It is immediately noticeable that the payoff structure is asymmetric with a favourable penny change in the dollar value of the euro worth initially 4 and later 6 times more to the bank than the client. The structuring of both exchanged options involves a choice of knock-out points for the client's option and knock-in points for the bank's.

Again pricing of such options is a complex matter which involves adjusting prices to incorporate higher prices for option values away from the rate at inception in terms of

[26] Payments were actually in Euros which results in a nonlinear version of this diagram but the dollar linear version shows the payout structure more clearly.

the so-called *volatility smile* depicted in Figure 16. Many different methods are available and in use by different traders and banks including the Monte Carlo method.[27]

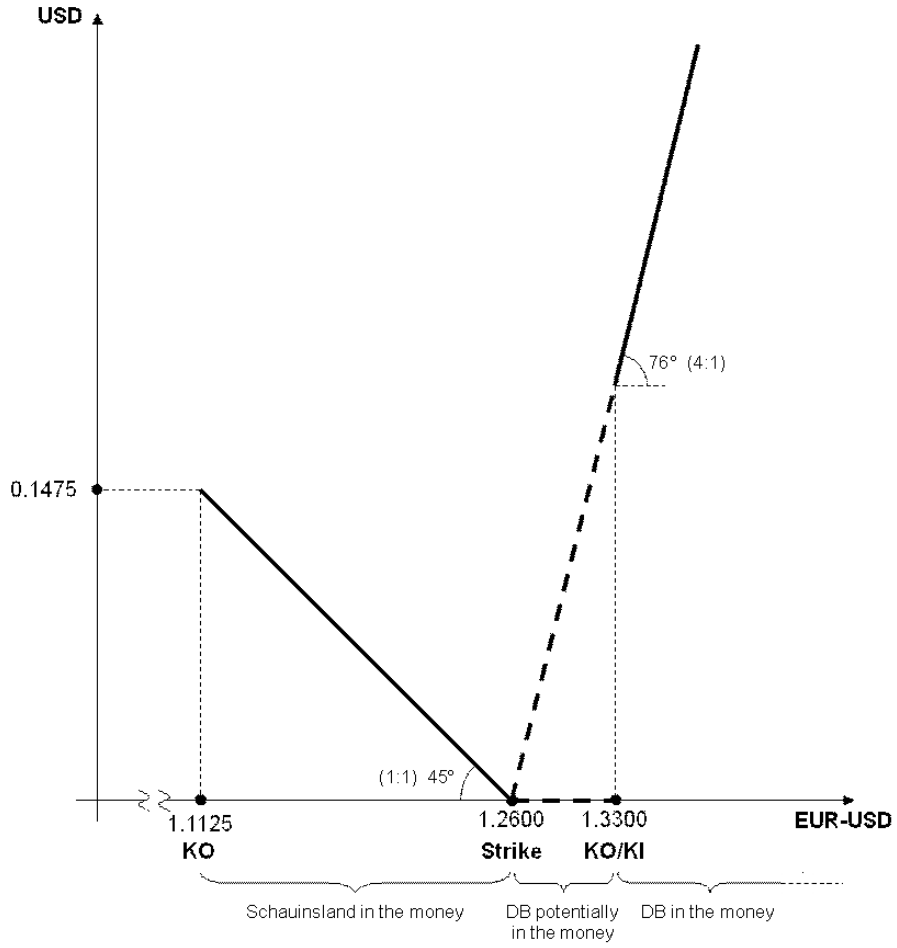

Figure 15 Counterparty option pair payoff diagram in USD on the EUR-USD exchange rate

[27] A Castanga & F Mercurio (2007), 'The vanna-volga method for implied volatilities' *Risk*, January, pp. 106-111, for a more advanced method often used.

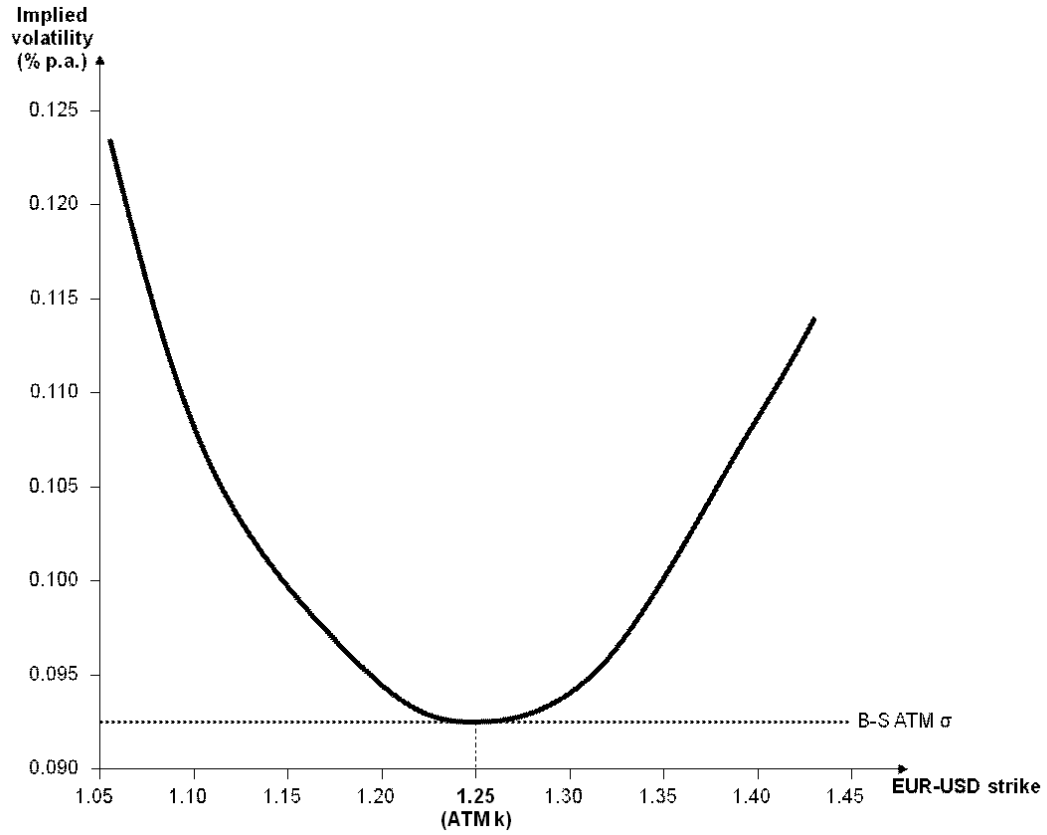

Figure 16 A representative EUR-USD implied volatility smile when the current rate is 1.25 USD per EUR

Over a 33 months 70 option pairs were exchanged between the bank and the client, many apparently mispriced in favour of the bank in that the clients options were underpriced, corresponding to *negative* smile corrections, and the banks overpriced. Whatever method(s) the bank use this is entirely inappropriate and leaves the impression of arbitrary pricing. Moreover a large proportion of these deals were restructured by the bank to incorporate the client's mark-to-market losses on the existing deal and postpone any cash changing hands between the counterparties. At such restructurings the bank always took the opportunity to improve the knock-in points for their option (the client's having been knocked out, i.e. dead) in their favour.

Nevertheless, no significant cash changed hands for 27 months in these contract exchanges until the deals struck in the last six months of the programme when in early 2008 the client was billed over 5 days for € 30.5 M even though some of the European options involved, a few struck in the previous weeks, had not yet expired.

OTC Structured Deals Summary

In this section we have described a number of representative failed OTC deals involving structured derivative and bond products. They have in common the features that they all possess an enticement to early client return but their final outcomes are highly skewed in favour of the issuing banks. Moreover the swap and FX deals usually involve (often multiple) restructurings by the issuing bank to incorporate (often mispriced) client mark-to-market losses on the existing deal and postpone the eventual client losses, which always grow substantially. It is clear that a bank's counterparty in this position, like a good trader, should always cut their losses at the first opportunity, but unfortunately they seldom do.

Legal Aspects of Failed Derivative Deals

Caveat emptor and market transparency

Obviously the fact that an investor suffers losses from an investment does not of itself ground any claims for compensation. On the face of it, this is a typical case for *caveat emptor*. Markets are highly efficient at the allocation of resources. One of the mechanisms behind that efficiency is the principle that prices are set by the competitive interaction of buyers, not sellers (as is typified by auctions). Sellers are, to a degree, responsible for what they say about their products. If, however, they make no

representations about it, then it is up to the buyer to ensure that the purchase makes sense for him. Allowing, or requiring, sellers to set prices counteracts market efficiency. And the criteria for price, fitness for purpose, and the like apply strictly *ex ante* – being wiser after the event is irrelevant for the validity of the contract.

Nonetheless, although *caveat emptor* is an effective device for ensuring market efficiency, it is only a device, not the basis of the market itself. Ultimately, the market is a system for generating information about the goods and services society needs at any given moment. Benefits of this sort flow directly from the market's openness and transparency. In contrast, situations where information is being suppressed or perverted contravene market principles at a more fundamental level than any individual departure from *caveat emptor*.

The law promotes transparency and openness in the market with the aid of various principles. First, it can exclude persons who do not have the *capacity* to deal in the market: the ignorant or those not competent to take risks with the property entrusted to them. Second, it can strike down bargains reached on the basis of *false representations* or *fraud*. These restrictions on pure *caveat emptor* are relevant in the cases we have mentioned, and we shall now look at them in more detail.

Capacity to contract

Capacity is the classic topic of derivatives litigation, having been the central theme of the *Hammersmith*[28] case, and, more recently, of *Haugesund v Depfa*[29]. As a matter of principle, speculation as such is probably never within the “capacity” of municipalities,

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[28] *Hazell v Hammersmith and Fulham LBC, [1990] 3* All ER 33 (QBD and CA), [1991] 1 All ER 545 (HL).

[29] 04.09.2009 – [2009] EWHC 2227 (Comm).

which means the contracts are void and that third parties purporting to enter such agreements with municipalities are likely to emerge empty-handed, whether they "won" or not.

Capacity to contract – or its absence – is a significant part of the law of obligations, though less so than in the past. Today, for example, wives can generally speaking make valid contracts without the consent of their spouses, and it is no longer possible for commercial corporations to avoid obligations to third parties by reference to their terms of incorporation[30]. Municipalities are different, however. The doctrine that they cannot validly perform acts which lie outside the powers granted to them by legislators ("ultra vires") is definitely still part of English law and probably also part of German law. The "Fischereiwirtschaft case"[31] explicitly recognised *ultra vires* as part of German law, though German courts have subsequently been reticent about using the term. Possibly a notion like "exceeding one's radius of action"[32] which does play a part in German administrative law, identifies an equivalent position.[33]

Whether or not *ultra vires* as such is valid, the issues in any particular case will have more to do with two further elements.

First, are financial instruments like swaps "speculation", or are they not simply modern instruments of what is known as "debt management"? If the latter, surely they can be legitimately deployed as incidental to most municipalities' powers to organise their debts in the best possible way, at least if they are used only to modify the

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30 First Company Law Directive, 68/151/EEC, Art. 9.

31 BGH 28.02.1956, BGHZ 20, 119.

32 *Überschreitung des Wirkungskreises, Überschreitung des Wirkungsbereichs*

33 W. Kewenig, H. Schneider (1992), 'Swap-Geschäfte der öffentlichen Hand in Deutschland', *Wertpapiermitteilungen*, Sonderbeilage 2/1992.

conditions of particular existing debts? Contrary to the tenor of the English decisions[34], administrative practice in Germany seems willing to countenance the use of swaps subject only to the criterion of "connexity" - i.e., that swaps must be referable to existing debts (though the precise functioning of this criterion is a matter of some obscurity). No German court has taken the view that swaps were outside the powers of local authorities, though the matter has not so far been fully argued.

Second, what of municipalities or municipal offshoots which are not mere creatures of public law? In *Hammersmith*, for example, there was considerable debate about whether a London borough, which is a corporation set up by royal charter and thus can in principle do anything that an "ordinary individual" (i.e. a natural person) can do, is subject to the same limits on its power as a local council. In relation to the Borough corporation, the English courts rejected the argument that it could speculate even if a council could not, among other things on the grounds that its income was subject to statutory constraints and could only be used subject to those constraints, however "free" the corporation as such might otherwise be ("the permitted use of council funds [is] not affected by the extent of the theoretical, legal capacity of the corporation")[35]

There are analogous distinctions in German administrative law between municipalities, which are always creatures of some higher legislature, and sovereign bodies such as the state and federal governments. This has not so far been an issue in swap disputes, though it might conceivably be relevant to situations where state banks (*Landesbanken*) have been involved in swap deals.

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34 See the House of Lords in *Hazell v Hammersmith & Fulham LBC* [1991] 1 All ER 545

35 CA per Sir Stephen Browne, *Hazell v Hammersmith & Fulham LBC* [1991] 1 All ER 545, at 77 f.

Questions of capacity are also relevant to cases in which the swap investor is not the municipality itself, but a private law entity set up by the municipality to perform certain of its functions. Certainly it might be argued that a private company wholly owned by a municipality, set up under powers conferred by statute and performing statutory functions, should in principle be subject to the same constraints on its use of public money as is a purely statutory body (by analogy with *Hammersmith* in the English courts). Hitherto, however, German courts have resisted any attempt to subject a municipality's private law activities to public law rules. This obviously makes a degree of sense in formal terms. Beyond that, it also reflects the fact that German administrative law provides in detail for supervisory bodies to restrain acts in excess of jurisdiction, but with methods which can only be invoked in the context of the administrative structure itself.[36]

The Landesbanken have not, historically, been corporations within Art. 9 of Directive 68/151/EEC. The extent to which this would allow them to rely on their statutes as against third parties is unclear, but it seems doubtful whether such statutes would exclude the purchase of any financial instruments, however speculative (see Law establishing the Bavarian State Bank, Art. 2 (3)).[37]

Implied Terms

Financial deals are subject to a number of terms implied by law or statute.

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[36] *Genehmigungsbedürftigkeit*, *schwebende Unwirksamkeit* etc., see § 58 (2) of the Administrative Procedure Act.

[37] It is probably the case, however, that *ultra vires* applied to Landesbanken in their earlier incarnation, when they more closely resembled public bodies – see Christian Koenig in WM 49 (1995), 317-325.

Good faith

A “fallback” term which is everywhere implied is good faith. This is in some respects more familiar to Continental legal systems[38] but uncontroversially also plays a role in the common law treatment of financial relationships.[39] What it means in the present context is probably the same in either system: good faith means honesty and the absence of deception or fraud. It is not acceptable to deceive the counterparty for one's own gain.

How far this gets a claimant in a swap case is doubtful. “Deception” generally has to be active; failing to clear up the counterparty's misconceptions is not generally dishonest unless there is a duty to do so. A duty arises when good faith requires it, for example because the counterparty is obviously and justifiably depending on information from the Defendant.[40] This argument is somewhat circular, however, and leaves open the question of what good faith specifically requires. In the case of professional investors, it might readily be said that it is *not* justifiable, in the absence of explicit provision, for a buyer to rely on the seller to clear up any misconceptions.

Under the MiFID regime[41], sellers are in any event entitled to assume that “professional” buyers know what they are doing[42] though this does not necessarily cover the case when a seller has *actual knowledge* that a buyer doesn’t know what he is doing.

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38 See the German concept of “Treu und Glauben”, MüKomm BGB, §§ 242 Rn 10; §§ 242 Rn. 1.

39 *IFE Fund SA v Goldman Sachs* – [2007] EWCA Civ 811 (65 ff); *Socimer International Bank Ltd (in liq) v Standard Bank London Ltd* – [2008] EWCA Civ 116 (106).

40 *Wendtland*, in: *BeckOK BGB*, §§ 123 Rn 11-12.

41 which has only applied since 2007 and is thus not relevant for most of the examples mentioned here.

42 Directive 2006/73/EC, Art. 36.

Advice

There is so far no case law on MiFID and it is unclear how much difference it will make to securities sellers' duties, in as far as investors have hitherto been able to invoke them in the individual Member States.[43]

In Germany, this may mean that the courts will continue to imply terms establishing a contract of advice.[44] Under *Bond*, this arises in any case in which a securities dealer engages in any discussion ("Gespräch") with an investor with a view to the purchase of a security. This obviously engages a wide spectrum of cases, though it excludes an "execution only" scenario.

It is particularly important that, in *Bond* terms, the relationship of advice arises without regard to the status of the customer. If it turns out in the course of the relationship that the customer is experienced (or even "professional"), then the dealer's advice may be abbreviated accordingly. But the relationship remains one of advice rather than one of mere "information". Thus, if he is aware of it, an adviser may not disregard the fact that his customer is labouring under material misconceptions. The difference between a duty of information and a duty to give advice is that the latter requires active engagement in the customer's individual state of mind and knowledge. In principle, then, that applies just as much when the bank is selling to another bank as it does when the customers are widows and orphans.

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43 see, for Germany, § 31 WpHG.

44 the so-called Bond caselaw - BGH 06.07.1993 – XI ZR 12/93; see Podewils/Reisich, (2009), at page 121.

Representations

There is clearly a good deal of scope for misrepresentation in deals which come with generous documentation, often amounting to hundreds of pages, and intensive sales presentations.

Causation

Not surprisingly, however, sellers of derivatives usually garnish their documentation with a multitude of disclaimers. Indeed, it is at this point that claims from investors typically fail. However much sellers may misbehave, for example by extolling their products for virtues they do not have, this will not be regarded as causative if the customer was an experienced investor, the literature contained clear disclaimers and warnings which were seen and acknowledged by the investor.[45]

German courts have in a number of recent derivatives cases followed a similar line of argument: as long as it is made clear that the product involves a substantial amount of risk, experienced investors cannot claim that their decision was materially influenced by the sales team's representations, whatever these may have contained. The warnings mentioned above ("theoretically infinite risk", and so on) have been held to be more than sufficient by a number of appeal courts.[46]

Representations as to randomness

Warnings as to risk may not be sufficient on their own, however – in particular it may be insufficient if such warnings are not quantified in terms of fair value as well as risk

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45 *Bankers Trust v PT Dharmala* [1996] CLC 518; *Morgan Chase v Springwell* [2008] EWHC 1186 (Comm).

46 OLG Bamberg, 11.05.2009; OLG Celle, 30.09.2009; OLG Düsseldorf, 29.06.2009, OLG Frankfurt supra note 15.

and return. At least one German court has now accepted that this may be the case.[47] The argument goes as follows:

As several German courts have accepted, instruments like the swaps described above are, functionally, wagers.[48] Gambling debts are in most European countries irrecoverable.[49] Swap debts are not in general caught by this, because in most countries financial instruments – or, more specifically, contracts for difference, which used to be regarded as bets – have been taken out of the restrictions on betting provided at least one of the parties is a regulated financial institution.[50]

So far, however, German courts have been slow to see the implications of their own viewpoint. They have tended to assume that if the swaps are wagers, and that if this was apparent to both parties, then the customer cannot legitimately complain about the outcome: he knew (or should have known) it was a wager, therefore he obviously wanted a wager, and everyone knows that wagers can be lost. Moreover, because the counterparty was a regulated bank, the debts incurred in the wager were recoverable!

This argument obscures the fact that categorising something as a wager raises a new set of legal consequences which go beyond the question of debt enforceability. Wagering contracts have their own rules or implied terms.

Under German law, for example, a person who proposes a wager represents by his conduct (i.e. even without doing so explicitly) that he has not influenced the random

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47 OLG Stuttgart, supra note 14. Some of these issues are expected to be decided by the Federal Supreme Court (BGH) during 2011.

48 OLG Bamberg, supra note 45.

49 Henssler, M. (1994), *Risiko als Vertragsgegenstand*, Tübingen: Mohr Siebeck.

50 see, for example, § 37e WpHG; Gambling Act 2005 s 10.

character of the event.[51] Under English law, presumably any undisclosed interference with the randomness of the object of the wager constitutes "cheating"[52] In both cases, it is an implied term that the object of the wager has not been interfered with. Generally, in both Germany and England, for gaming or wagering which departs from the principle of "equal chance" not to be fraudulent, this fact must be disclosed. (Moreover, outside "equal chance", all gaming and betting is subject to licensing requirements and other restrictions.)

Modern derivatives, as we have seen, are traded on the basis of fair market values. This is the starting point for price negotiations (at least from the bank's point of view, whether or not the customers realise this is happening). Moreover, the ascertainment of a fair value by statistical means necessarily generates information about risk – which the banks also use for their own trading purposes. Modern derivatives sellers know about the random distribution of their products, and they use this knowledge for pricing and for risk management.

Clearly, diverging from fair value to the benefit of the seller is not "just" a matter of putting in a profit margin, for it alters the balance of risk and return as between the parties. Setting the strike price at a figure that makes the swap diverge from its fair value is analogous to adding green (zero) pockets to a roulette wheel. Pockets change the odds for the benefit of the casino (and, in the long run, provide its profits). Such an intervention is fair, however, because it is disclosed. The pockets on the casino's wheels are clearly marked by their distinctive colour, and the manipulation of the odds can readily be calculated by anyone anxious to do so. This transparency is not available,

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51 Schönke/Schröder (2001*), Strafgesetzbuch*, Kommentar, 26. ed, München §§ 263 Rn. 16e.

52 Gambling Act 2005, s 42.

however, to derivatives buyers unless they (a) already understand the concept of fair value and how the seller is using it as a basis for his price negotiation, and (b) have a quant department to calculate the odds. Requirement (a) could in principle be met, but in the past clearly hasn't been for the vast majority of investors, however "experienced". As for requirement (b), we assume that it is currently not met even by major institutional investors.

In principle, then, non-disclosure of an intervention materially affecting the chances of a wager must be fraudulent. If, as has happened in all the cases mentioned above, the seller has structured the instrument so as to affect the balance of risk and return to his benefit, then he must say so, and he must put a number on it. Generalised declarations as to "infinite risk" or "no worst case can be specified" are certainly not enough, for they not only fail to identify the real question, they actively divert attention from it.

Representation Summary

There appear to be two grounds on which investors of any category – i.e. not only "consumers", but "professionals" as well – can in principle impugn complex structured finance deals.

Breach of good faith: If investors can establish that the dealer was under a duty to give advice, then any failure by him to clear up material misconceptions that were or should have been evident is dishonest. Such a duty may arise, for example, under an implied term (as in Germany's *Bond* case law). Misunderstanding the nature of price and risk in a complex derivative is a material misconception.

Misrepresentation. In the absence of statements to the contrary, the offeror of a wagering contract implicitly represents that the balance of risk has not been manipulated. Even if it is clear to the buyer that the instrument is, functionally, a wager, this does not absolve the seller of a duty to disclose any interference.

Inadequate or false representations as to something that is basically a wagering contract can ground claims in ways that bypass questions of capacity or of causation. In principle, any investor, even including a sophisticated institution, is entitled to be told what risks his counterparty is preparing for him. It is not enough to warn the investor of "infinite risks", because that, whether true or not, is merely incidental to what the counterparty's interventions have actually achieved for himself. This applies however sophisticated the investor is: if he clearly doesn't know what game he has joined, then the counterparty must tell him. It is difficult to see how that information can avoid including the basic element of the counterparty's pricing – namely, the divergence from fair value.

Conclusion

Courts have been relatively slow to move from *caveat emptor* to the considerations above more appropriate to OTC derivatives. It seems however that they are nevertheless finally moving towards an understanding of the problems posed by modern derivative instruments, although they are undoubtedly faced with a steep learning curve. Of course this might become unnecessary if the types of OTC deals we have discussed in this paper are forced by legislation onto cleared exchanges. However, many tailored OTC products will likely remain in any case.

A cost effective relatively simple risk disclosure legislation in all jurisdictions could in any event alleviate the disclosure problems encountered by banking OTC clients. This would require institutions by law to display the asymmetric risks involved in their structured products along the lines of the NPV or PV distribution diagrams we have shown here for OTC swaps, bonds and FX contracts. We maintain that any potential client seeing the figures of this paper in an OTC term sheet would think twice about signing the contract. The result would be fairer OTC products and encourage the proper use of tailored derivatives by clients for hedging various risks. The concomitant would of course be smaller margins for banks, perhaps not a bad thing!