

An Overview of Hedge Funds and Structured Products: Issues in Leverage and Risk

Adrian Blundell-Wignall

With their high share of trading turnover, hedge funds play a critical role in providing liquidity for mis-priced assets, particularly when large volumes are traded in thin markets – thereby reducing volatility. This activity is particularly important, given the rapid growth in volume of new-generation structured products issued by investment banks.

Hedge fund leverage estimated via an induction technique suggests a leverage ratio that must be above 3 (versus total AUM of USD 1.4 trillion). Gearing is required to boost returns where low risk and low return styles are implemented. Investment banks are well capitalised against hedge fund exposure.

“Structured products” are one of the fastest growing areas in the financial services industry, and may already be over half of the notional size of the hedge fund industry (AUM plus leverage). These products, constructed by investment banks, are extremely complex using synthetic option replication techniques, and offering a variety of guarantees in returns. They are sold to retail, private banking and institutional clients. Hedge funds help reduce volatility risk for investment banks in supplying these products.

Structured products are passive in nature (unlike hedge fund active styles), focusing on providing returns for different risk profiles of clients. These products have not been tested when major anomalies in volatility arise. They are highly exposed to downward price gaps in the ‘risky’ assets used in their construction. Considering the potential for such a crisis scenario, two major policy conclusions emerge: The importance of (1) stress testing of investment banks’ balance sheets; and, (2) given the large retail market segment, consumer education and protection.

An Overview of Hedge Funds and Structured Products: Issues in Leverage and Risk

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Executive summary

- The size of the hedge fund sector, using IOSCO sources and results from responses to an OECD Questionnaire on Hedge Funds, is around USD 1.4 trillion in assets under management (AUM). While this does not seem that large compared to total global AUM, the hedge fund share of trading turnover (augmented by leverage and investment style) is much greater than its share of global AUM.
- On the issue of volatility, this paper shows that hedge funds play a critical role in providing liquidity for mis-priced assets – arbitrage opportunities – particularly when large volumes are traded in thin markets. This is a volatility reducing activity. This activity is particularly important, given the rapid growth in volume on new-generation structured products issued by investment banks.
- Hedge fund return performance, costs and style data can be combined to back out an implied number for global hedge fund leverage (in the absence of any hard data). The leverage ratio has to be well above 3 to come even close to consistency with the performance return numbers – leverage of over USD 5 trillion is implied.
- This leverage does not imply undue risk. This is because gearing is

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required to boost returns on AUM for investors in hedge fund activities which, by their very nature, are low risk – because hedge funds to a large extent engage in market-neutral arbitrage activities that do not depend on the direction of the market.

- Investment banks have strong capital adequacy, in particular with respect to their hedge credit fund exposures – some estimates of which are provided below.
- Ironically, the fastest growing area of new financial products that utilise highly-complex derivative products exclusively lies mostly within the regulated sector. This is the market for “structured products” that are produced by investment banks and sold to retail, private bank and institutional clients. The strong volume growth in this area, particularly in Europe and Australasia, creates ex-ante derivative pricing pressure, and hedge funds frequently take the other side of the trades (reducing ex-post volatility).
- The size of this market is very roughly estimated to be around USD 3.8 trillion, already over half of the notional size of the hedge fund industry (AUM plus leverage), and growing quickly in the last two years.
- Structured products are passive in nature (unlike hedge fund active styles), and focus on providing returns (for different risk profiles of clients) with some element of capital guarantee. Constant proportion portfolio insurance (CPPI) is one of the popular new-generation techniques. These products have not been tested when major anomalies in volatility arise. They are highly exposed to downward price gaps in the ‘risky’ assets used in their construction.
- The potential for a crisis scenario in the event of such anomalies in volatility, with multiple investment banks having to close positions (due to ‘knock-on’ effects) is considered. Hedge fund and other counterparty’s ability to meet calls in this situation would affect the size of the balance sheet risk for investment banks.
- This raises two main policy issues. (1) The balance sheet risks to investment banks offering guaranteed products: stress testing for worst case scenarios and ensuring capital adequacy for them is important to reduce concerns about financial stability; and (2) given the large retail market segment, consumer education and protection.

I. What is a hedge fund?

Hedge Funds have grown quickly over the past ten years, and are important part of the financial landscape. They are difficult to define as entities, because the line between what hedge funds do that other institutions do not is blurred – proprietary traders in investment banks, private equity funds, and fund managers all use extensive leverage and derivatives to trade markets or to shift risks.

Lightly-regulated active investment style using derivatives

The definition of a hedge fund used here is as follows: lightly-regulated managers of private capital that use an active investment approach to play arbitrage opportunities that arise when mis-pricing of financial instruments emerge. Extensive use of leverage and derivatives is a common feature of hedge funds.

The main differences between a hedge fund and a private equity fund are: (a) the private equity fund looks to use leverage to buy companies to obtain full management control for purposes of changing its structure operations, whereas a hedge fund trades assets without looking for full control; (b) the hedge fund covers a multitude of styles, only one small part of which might involve buying shares to force management to make value enhancing changes (activist); and (c) hedge funds often (but not always) have a shorter investment horizon than private equity firms.

They play a key role in providing liquidity

Overall, hedge funds fill a broad role in providing liquidity in markets where pricing anomalies have occurred, often due to lack of breadth. In the main this is a volatility reducing activity that is an essential part of the efficient working of financial markets and financial stability.

II. Hedge fund industry size: AUM *versus* turnover

Size of USD 1.4 trillion AUM

At the start of 2007, estimates suggest that hedge funds have over USD 1.4 trillion assets under management (considerably less than the USD 18 trillion in mutual funds; see Table 1). Some high-end estimates have it higher at closer to USD 2 trillion. The bulk of hedge fund activity is in the United States, followed by the United Kingdom and EU (ex UK), with Australasia next.

Table 1. Hedge funds' assets under management (AUM)

Country	Mid 2006 Estimates
	\$bn
USA	870
UK	320
EU	118.4
Australia	47
Non-Japan Asia	34.05
Switzerland	23.1
Canada	11
Japan	7
TOTAL	1430.55

Source: IOSCO; and OECD Questionnaire on Hedge Funds.

Augmented by leverage

Of course the 'fire-power' of hedge funds is greatly augmented beyond this by leverage, though the amount of this is uncertain due to lack of reporting and the difficulty of assessing the implicit gearing of derivatives.

Table 2. Shares of hedge fund trading in the US market

Shares of Hedge Fund Trading in US Markets	
	%
Cash equities	30
Credit Derivatives (plain vanilla)	60
Credit Derivatives (structured)	33
Emerging Mkt Bonds	45
Distressed debt	47
Leveraged loan trading	33
High Yield bond trading	25

Source: Greenwich Associates, as reported in *The Financial Times*.

And have a large impact on market turnover

Leverage, when combined with a rapid and focused trading style, allows hedge funds to have a much bigger impact on market turnover than the AUM figures would suggest. In Table 2 data from Greenwich Associates suggests that hedge funds account for between 30% and 60% of market turnover, depending on the financial instrument concerned. This of course is very large indeed, and illustrates why understanding financial market behaviour today without

including explicit analysis of hedge funds is quite impossible.

Two concerns often raised with respect to hedge funds are: (a) that they create volatility in markets due to their large role in turnover, and (b) that the leverage they undertake may raise financial stability issues, where defaults with counterparties occur – an issue given some credence by the late 1990s failure of LTCM, that required a major private bank-led work out to resolve.

III. Hedge funds reduce volatility

Volatility-reducing role

The analysis in this paper suggests that hedge funds play a very positive role in financial markets by providing liquidity to thin markets where mis-priced financial instruments are to be found. This type of activity reduces volatility rather than increasing it.

Particularly given the growth of structured products

Indeed with the rapid growth of structured products in recent years, particularly in Europe and Asia, hedge funds have been quite critical in containing the volatility that might otherwise have arisen. Structured products are largely driven by investment banks, and have resulted in the proliferation of new and highly-complex derivative products (discussed below).

Figure 1 shows the VIX index of market volatility, the junk bond versus AAA spread and the TED spread (the offshore Eurodollar 3-month rate versus the 3-month Treasury). Volatility has fallen, and spreads have narrowed.

Hedge funds are put sellers in the carry trade

In large part, spread narrowing in the past few years has been a process that has been driven by hedge fund or ‘carry’ trades. These carry trades are usually implemented with derivatives. A spread emerges where risk premia in two financial instruments differ. These are taken advantage of by selling puts. These pay the seller a premium in income (positive ‘carry’) and work as long as the spreads do not blow out as a consequence of some credit event. The buyers of puts (the other side of the trade), have negative carry (they pay a premium to the seller) and so continually lose money as markets rally and spreads narrow. Buyers rely for profit on an

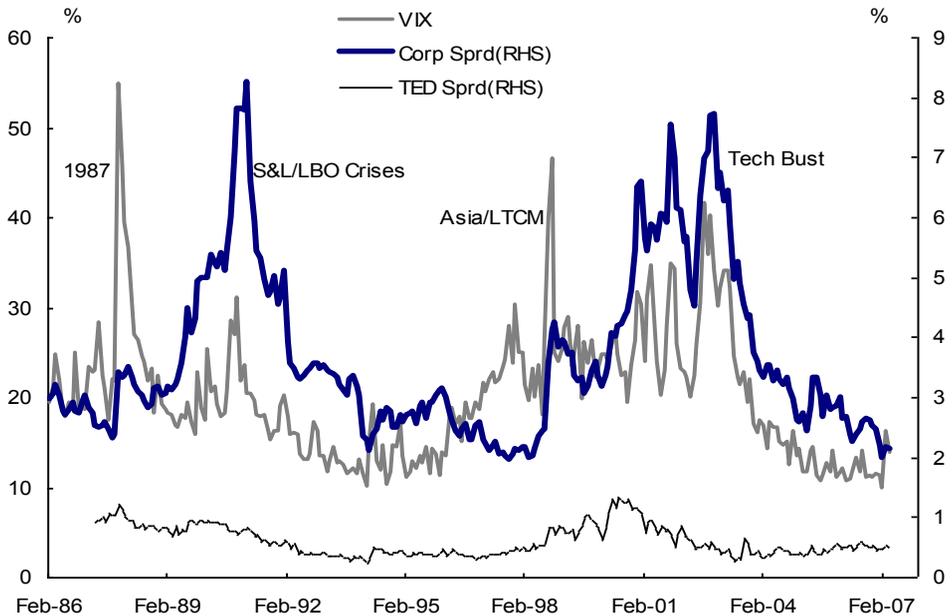
adverse credit event to occur to put them ‘in the money’. The longer this does not happen the greater is the incentive of buyers of puts to stop further losses by quitting the trade. As this occurs the spreads have to narrow further (because buyers of puts need to be induced by further price action). In the absence of exogenous risk events, volatility continues to fall and spreads narrow.

Structured products are natural buyers of puts

Passive buyers of puts, including investment banks buying for capital guarantee purposes in structured products, benefit from spread narrowing in pricing their products for retail, private banking and institutional clients – encouraging the growth of this market.

Figure 1. Falling volatility narrowing spreads

Market volatility, corporate spreads and the TED Spread



Source: Thomson Financial Datastream.

IV. Hedge fund performance, fees and costs

Table 3 shows hedge fund composite performance reported in Thomson Financial Datastream *versus* the MSCI global equity index. These returns are net of MERs (management expense ratios, arising from trading), incurred as costs to make the returns, and fund manager costs.

Hedge fund performance has been declining

Three things stand out: (1) hedge funds have managed to outperform the global index on average, but not every year; (2) hedge fund performance is correlated with global performance, but does much better relatively when equity markets are weak or falling (good diversifying characteristics); (3) both total and relative performance have declined in the 2000's.

Table 3. Hedge fund performance

Year	Equities World Index	Hedge Fund MSCI Universe	Ret Diff
1991	16.0	32.2	16.2
1992	-7.7	21.2	28.9
1993	23.1	30.9	7.8
1994	4.1	2.6	-1.5
1995	14.4	25.7	11.3
1996	10.9	18.0	7.1
1997	11.3	18.3	7.0
1998	19.6	7.9	-11.7
1999	30.5	26.4	-4.2
2000	-16.4	15.0	31.3
2001	-17.6	7.6	25.2
2002	-18.5	2.5	20.9
2003	34.8	15.4	-19.4
2004	15.5	6.9	-8.6
2005	11.2	8.1	-3.0
2006	21.3	11.3	-10.0
Av 1991-99	13.6	20.4	6.8
Av 2000-06	4.3	9.5	5.2

Source: Thomson Financial Datastream, Hedge Fund MSCI universe.

Hedge funds have to spend a lot to make a lot

Hedge funds' massive share of turnover means that they pay a lot to investment banks for their activities (execution costs), and the funds have to pay their fund managers very well. MERs are very high for hedge funds, compared to mutual funds (due to turnover). Broking estimates suggest

that about 25% of the pre-MER-traded returns are absorbed by fees paid to hedge fund managers, and around 20% are absorbed by execution costs to prime broker dealers, *i.e.* about 45% in all. So for the 11.3% return in 2006, hedge funds would have earned $11.3/(1-0.45)=20.5\%$ before MERs.

Which pushes towards more leverage

The point here is that to generate double digit returns to investors, hedge funds would have to try to earn raw pre-MER returns of 20% or so, and this further pushes pressure towards more leverage (to gear up the return from investing in low risk and return spread trades).

V. Hedge fund styles

Long-short styles dominate

A summary of the different styles of hedge funds and the proportion of the market they occupy is shown in Table 4, based on Hedge Fund Industry Research data. An indication of the broad activity involved in the style is shown on the right hand side. Most of these strategies are long-short in nature: all of the equity hedge (*e.g.* long a stock and long a put to hedge its fall); most of event driven (*e.g.* buy the target M&A company and sell the buyer); all of relative value arbitrage (*e.g.* buy the London listing and sell the Sydney listing if an arbitrage spread premium opens); and all of sector, convertible arbitrage and equity market neutral. The macro (*e.g.* long only) and other (*e.g.* corporate governance activist, structured products, etc.) categories include directional riskier plays.

Low-risk spread trades require leverage to make returns

The dominant nature of this long-short or spread trading activity explains why hedge funds do so well in market downturns (*i.e.* it is not directional). But it also explains why leverage needs to be relatively high: investing in a strong stock market generates strong returns, while investing in a low-risk spread in a long-short strategy does not. So the trade has to be levered up a number of times in order for the spread trades to generate competitive returns (while keeping the benefit of avoiding directional risk in the market).

This understanding of how the various styles work, together with the return and MER cost information, can be used to get some idea of overall hedge fund leverage.

Table 4. Hedge fund styles

Style	%	Nature of Strategy
Equity Hedge	29	Stock+deriv strategies
Event Driven	14	M&A, spin offs, bankruptcy re-org
Relative Value Arbitrage	13	Listing same security in 2 diff mkts
Macro hedge	11	Directional plays
Sector	5	Long one versus another
Distressed securities	4	heavy dicount work outs
Emerging markets	4	Equity and debt
Equity non-hedge	4	Activist raids
Convertible arbitrage	3	Buy convertible sell stock
Equity market neutral	3	Long one stock short another
Other	10	
TOTAL	100	
Equities activities	61.0	
Long short activities	72.5	

Note: The equities activities are very approximate and (apart for obvious categories) assumes ½ of event driven, ½ of relative value arbitrage, ½ macro, ½ of emerging markets, ½ of convertible arbitrage, and none of other is equity related. Long-short (apart from obvious categories) assumes 75% of event driven, ½ of other, and none of macro, distressed securities and emerging markets is of the long-short variety.

Source: Hedge Fund Industry Research Report Q3 2006.

VI. Implied hedge fund leverage

Data on hedge fund leverage is difficult to find, and more work needs to be done in this area

It is difficult to find data on hedge fund leverage, and more work needs to be done in this area. Illustrative calculations based on the nature of returns and the type of hedge fund activity can be used to infer some idea of the amount of leverage involved. These calculations show that hedge funds are likely to be somewhat less levered than banks and broker-dealers. This is as it should be, since banks come within the purview of regulation and supervision, and benefit from lender-of-last-resort facilities – they can take on more risk.

A simple calculation to imply leverage

The calculation is shown in Table 5. The fund styles are combined around the nature of returns: (a) low returns for fixed income arbitrage, about USD 97 billion in AUM – and

here we assume a 1% return (somewhere between the very low TED spread of around 0.5 ppt and the high 2 ppt spread on junk bonds versus AAA shown in Figure); (b) medium returns for equity type spreads of about 4%, reflecting the average equity risk premium, with about USD 919 billion in AUM; and (c) high returns for outright equity type long positions, with about USD 415 billion AUM – the 20% return for this grouping shown in the table is roughly equal to the MSCI return for 2006 shown in Table 3.

The implied leverage then is simple enough to calculate. Fixed income arbitrage managers would need to have geared their portfolios 19 times to generate the 20% pre-MER return earned in 2006 (in order to give the observed 11% to investors). This implies gearing of USD 1 835 billion, in addition to the USD 97 billion in AUM. Other long-short styles would have had to gear only 4 times to generate 20%, implying USD 3 676 billion in gearing. Finally, the long only funds would not have had to gear at all to generate the 20% return in 2006.

Table 5. Implied hedge fund leverage calculation

	AUM \$bn	Req Ret %	Observed Return %	Req Asset For 20% ret on AUM \$bn	Implied Gearing \$bn	Leverage Ratio on AUM x
Fixed Income Arb.	96.6	20	1	1931.2	1834.7	19
Other long short	919.1	20	4	4595.6	3676.5	4
Long Only	414.9	20	20	414.9	0.0	0
Total	1430.6			6941.7	5511.2	3.9

Source: OECD.

USD 5.5 trillion hedge fund leverage number

Together these 3 groupings imply an overall leverage ratio of only 3.9 times, or a total leverage of USD 5.5 trillion compared to the USD 1.3 trillion of funds under management. The bulk of this USD 5.5 trillion will come through implicit leverage in derivatives (see below).

VII. Counterparty risk with prime brokers

Table 6 uses publicly available information on prime broker counterparty exposures, using (published) company report balance sheet data. The 10 largest prime brokers in the area of counterparty risk were chosen, and these cover, on our best estimate, about 80% of the total. Margin lending is not broken out of other credit activities in the publicly available reports. Counterparties are typically other banks and hedge funds.

Table 6. 10 Prime brokers: published credit exposure to counterparty risk

As of December 2006

	Loaned Securities \$bn	Ratio to Tier 1 Capital	Reverse Repos \$bn	Ratio to Tier 1 Capital	Derivatives PRV \$bn	Ratio to Tier 1 Capital	Margin Loans NYSE Total \$bn	Total Credit Exposure \$bn	Tier 1 Capital \$bn
UBS	52	1.56	333	10.01	269	8.10	#N/A	#N/A	33
Credit Suisse	48	1.65	140	4.87	45	1.57	#N/A	#N/A	29
Deutsche	31	0.95	183	5.66	99	3.08	#N/A	#N/A	32
Goldman	22	0.66	82	2.45	68	2.02	#N/A	#N/A	34
Morgan Stanley	150	4.07	175	4.74	55	1.50	#N/A	#N/A	37
JP Morgan	9	0.11	122	1.51	56	0.69	#N/A	#N/A	81
Lehman	18	0.96	117	6.33	23	1.22	#N/A	#N/A	19
Merrill	43	1.09	178	4.47	32	0.80	#N/A	#N/A	40
Citigroup	60	0.66	121	1.33	50	0.55	#N/A	#N/A	91
Bear Stearns	11	0.89	39	3.03	12	0.91	#N/A	#N/A	13
TOTAL	444	1.09	1491	3.65	708	1.74	275	2926	408
Grossed Mkt Tot. (Top 10 =80%)	555	1.09	1864	4.57	885	1.74	367	3672	510

Source: Prime broker published balance sheet accounts; Thomson Financial and OECD estimates.

There are four key areas where prime brokers generate credit exposure in their financing relationships (counterparty risk). These are:

Sources of credit exposure in counterparty risk

1. **Securities lending:** the bank lends securities to hedge funds and others, and gets cash or other securities as collateral (found on the liabilities side of the balance sheet as cash received as collateral for securities lent). Hedge funds, for example, borrow stock in order to short securities. Other banks also borrow stock.
2. **Reverse repurchase agreements:** the bank buys securities from a hedge fund etc. which in turn commits to buy them back (found on the asset side of the balance sheet) – the hedge fund gets a credit,

but counterparty risk arises in the event that the customer cannot fulfil its obligations. This is an important mechanism of hedge fund borrowing.

3. **Derivatives:** derivative contracts with hedge funds create counterparty risk (found on the asset side of the balance sheet), which is measured as their positive replacement value (PRV). This is equal to the cost to the bank of replacing all the transactions with a fair value in the bank's favour, if all the relevant counterparties of the group were to default at the same time. This is a margin account concept, and massively understates the notional value of derivatives contracts (potential command over securities).
4. **Margin loans:** the bank advances a loan to a hedge fund (asset side) and gets a security from the hedge fund as collateral (usually cash and securities). As mentioned above, this important activity is not separately disclosed by prime brokers. However, we have total margin lending by members of the NYSE, which is shown in the table.

The bottom line of the table grosses up the numbers for industry totals, by assuming that 80% is covered by the top 10 firms. For the margin lending we assume 75% is covered by member of the NYSE.

But capital adequacy is very high in general

The main point to note is that counterparty exposure differs considerably between the prime brokers, with higher risk-taking firms (to generate higher returns) showing high exposures relative to tier 1 capital, and more conservative firms showing much lower ratios. The total exposure of the top 10 firms is about USD 2.9 trillion, and total Tier 1 capital is around USD 408 billion. The capital adequacy ratio *vis-a-vis* these activities is about 14%, which is very high. Furthermore, it should not be forgotten that there are offsetting collateral and risk measures taken throughout the market, and some of the measures like PRV of derivatives is the amount that would apply if 100% of the counterparties were to default. In other words, the call on capital is likely to be low overall.

This does not mean, however, that major stability issues cannot arise in the case of concentrations of risk for particular firms.

Exposure of prime brokers to the hedge funds group

One prime broker amongst the top 10 firms separates out its exposures between bank and hedge fund counterparties, for 3 of the 4 categories above (excluding margin loans). We have used this as a guide, together with broad discussions with other market participants, to come up with shares for each of the 4 activities as they pertain to hedge funds, shown in Table 7. Notice that these numbers are also broadly in line with the Greenwich percentage numbers on share of hedge funds in market turnover (see Table 2).

And particularly so with respect to hedge funds

Overall, the **prime brokers are very well capitalised** against hedge fund exposures. The exposure of prime brokers to hedge funds, as a ratio to Tier 1 capital, is 2.4. This is equivalent to a capital adequacy of around 42% *versus* the hedge fund sector.

Table 7. Hedge fund shares of prime broker counterparty exposure

	Total Credit Exp \$bn	Ratio to Tier 1 Capital	Hedge Fund \$bn	HF% Total Exposure	HF Exp Ratio to Tier 1 Capital
Loaned Securites	555	1.09	222	40%	0.44
Reverse Repos	1864	3.65	466	25%	0.91
Derivatives PRV	885	1.74	292	33%	0.57
Margin Loans	367	0.72	242	66%	0.48
Total	3672	7.20	1223		2.40

Source: Prime broker published balance sheet accounts, Thomson Financial and OECD estimates.

The overall credit exposure of prime brokers with respect to hedge funds is estimated to be around USD 1.2 trillion. This number is not far off the AUM of the hedge fund industry that we discussed earlier – possibly reflecting the fact that most hedge fund trades are carried out with derivatives, and other activities that require cash margin deposits or collateral to be posted. It is these sorts of deposits that are picked up in the prime broker accounts.

Derivatives are the biggest source of leverage for hedge funds

The command over notional assets, however, is much stronger than reflected here. The implicit leverage in derivatives is very large. If we took out USD 5.5 trillion calculation for total leverage, and treated loaned securities, reverse repos and margin loans as fully collateralised, then derivatives PRV of USD 292 billion would, as an example, reflect an implicit derivatives leverage of USD 4.6 trillion (= USD 5.5 trillion – USD 0.9 trillion other debt).¹ So derivatives are easily the biggest source of leverage for hedge funds.

VIII. What is a structured product?

Structured products are not discretionary

The term ‘structured product’ is the name given to an investment product that provides a return that is pre-determined with reference to the performance of one or more underlying markets. The performance of a structured product is therefore based only on the performance of this underlying product and not on the discretion of the product provider. Most often the product relies on the use of derivatives to generate the return, and contains downside protection or guarantees of some form via options.

Structured products are therefore **passive in nature**, with the cost depending on option and other derivative premia. This contrasts with hedge funds, where the fees are justified on the basis of buying the manager’s active skills.

Structured products may be of the growth variety, offering equity-like returns, but typically including varying elements of capital protection. They also include structured notes, which replicate fixed income products. CDOs (Collateralised Debt Obligations) and CLOs (Collateralised Loan Obligations) would fit into this category of description if they came with derivative transformations.²

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1. This would imply an average margin of about 6% (= 292/4600 %). If anything this is on the large side for margins, suggesting even higher leverage. But different deals have quite a wide range of margin requirements, and this average number is not wildly out of line.
 2. Some of the income products provide a high income component, but with a risk to the capital return if markets fall (e.g. an equity underlying security with a sold call to

Tranche and continuous product varieties

The products are sold in two broad forms: (1) the ‘tranche’ variety, *i.e.* with a fixed maturity date (typically 1-5 years), or (2) as ‘continuous’ product with no fixed maturity date. They may be closed-end funds, or the seller may be able to cancel shares on redemptions like a mutual fund.

Complex derivative structures are used

While structured products have been around for a long time in various forms, the new-generation portfolios sold use highly complex derivative structures. They use synthetic options replication techniques to tailor products to all combinations of risk and return for investors.

Use of complex derivatives

Constant proportion portfolio insurance

The most popular products use Constant Proportion Portfolio Insurance (CPPI). This is the name given to a trading program that is designed to ensure that a fixed minimum return is achieved either at all times or, more typically, at a set date in the future. Essentially the strategy involves continuously re-balancing the portfolio of investments during the term of the product between so-called risky assets (usually shares) and non-risky assets (usually bonds or cash). As the value of the risky assets rise, more of the portfolio is placed in these assets; but conversely, as they fall in value, more of the portfolio is placed in the non-risky assets. By following the rules set out by the strategy the minimum return can be achieved as long as the value of the risky assets does not fall too sharply. In this case, however, the product provider offering such a product would rely on a guarantee or option provided by a third-party investment bank to ensure that the minimum return was achieved – this is the capital guarantee aspect of the product, wherein lies most of the cost in buying them.

Sold to retail private banking and institutional clients

Because structured products emphasise downside protection with simultaneous participation in the upside, they are very attractive to retail investors. They are sold by investment banks to their retail broking arms. However, they are also sold to private banking clients and to institutions (fund managers, hedge funds, etc).

boost income – so that some of these products can participate in a falling market to some degree).

These CPPI products are difficult to understand for technical analysts, so there can be no doubt that the retail buyers of these products will not understand what they are buying. They are often sold with promises of best ex-post returns from a basket of securities, with downside protection – sometimes very much like betting on the winner of a horse race after the race is run. For the 1-1.5% spread cost to the client, such outcomes are deliverable, provided volatility remains normal.

Policy issues

The policy issues that arise here are:

Consumer protection issues arise

1. Financial education and consumer protection, given the complexity of the products; and

Capital adequacy is critical

2. The extent to which financial institution capital standing behind these products (as an ultimate guarantee) might be at risk, if volatility moves into abnormal patterns.

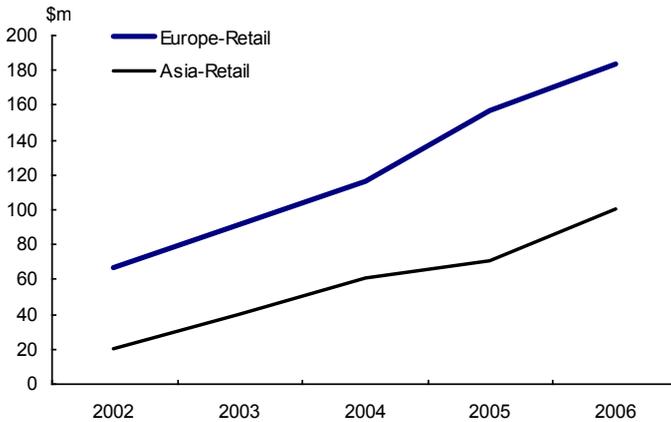
IX. Structured products: the new growth area

Structured products are very popular in Europe and in Australasia, and are becoming more popular in the USA.

Structured products sales have been booming in recent years, particularly in Europe and Asia

Figure 2 shows that structured products are one of the fastest growing areas within the financial services sector. In 2002 about USD 65 billion of these products were being issued to retail clients in Europe, whereas by 2006 this had grown to over USD 180 billion of new issues per annum. In 2002 about USD 20 billion was issued to retail clients in Asia, whereas by 2006 the volume was closer to USD 100 billion. These sales considerably understate the flows into the market, because the industry provider of the retail data only has coverage from clients that subscribe to the service. Furthermore, there are no data on the sales to private bank clients (very wealthy individuals with large minimum size investments), nor to the institutional market.

Figure 2: Gross sales of structured products p.a. to retail clients



Source: www.structuredretailproducts.com, and investment banks.

The outstanding size of live global structured products could be around USD 3.8 trillion

The approximate size of the outstanding AUM on the retail side of the market is about USD 1.2 trillion. But the private banking and institutional parts of this market are also very large. Industry intelligence suggests that both of these other areas are similar in size to the retail market for structured products. If this is broadly correct, it would put the size of the structured product market at about USD 3.8 trillion (see Table 8). This (very approximate) size of the total structured products market is just over half the estimated size of the hedge fund notional size (allowing for leverage) of about USD 6.9 trillion.

Table 8. Stocks of outstanding products

	EU \$bn	USA + Can \$bn	Asia \$bn	Total \$bn
Retail	788.39	192.34	290.00	1270.74
Private Banking	#N/A	#N/A	#N/A	#N/A
Institutional	#N/A	#N/A	#N/A	#N/A
Total 3x (?)	2365.18	577.02	870.00	3812.21

Source: StructuredRetailProducts.com, and guesses based on discussions with the industry.

X. Structured products and hedge funds in a ‘gap’ scenario

The volume of issuance (sales) and the size of outstanding structured product portfolios have a material impact on derivative pricing and spreads. An investment bank will issue derivatives into the market to construct portfolios for sellers of these products, creating natural opportunities for hedge funds to come in on the other side of the trade. It is common knowledge in investment banks that hedge funds help to reduce their volatility risk, providing liquidity in a very complementary way.

Falling volatility and spreads as the volume of product grows requires normal volatility

For example, active hedge fund spread trades alluded to earlier are carried out by selling puts – while portfolio insurance by buying puts is a very important part of providing downside protection to risky assets within a CPPI product. All of this volatility reducing and spread narrowing activity assumes markets continue to perform in the manner that they have in the past few years.

The risk is a major exogenous event that reverses the virtuous circle

The main risk is that a major (exogenous) volatility event occurs. A sharp rise in volatility (known as a ‘gap’ event) poses a risk to the virtuous circle situation described earlier. It is by no means clear that the CPPI and related products could cope with such a gap event, and positions would have to be closed. **The size of the potential stability issue that could emerge would depend on:**

1. the size of the fall in the market – a move of 20-25% – would be a major test;
2. the extent to which investment banks had similar products and had to close positions at the same time, leading to bigger market fall – knock-on effects;
3. the extent to which sellers of protection, including hedge funds, could meet their calls – any defaults would further accelerate the process;
4. the extent of redemptions demanded by structured products and hedge fund clients as risks became a public concern.

If products could not deliver the prospectus-promised returns, in such a vicious circle event investment bank balance sheets would have to cover losses.

This is a major area of policy interest. Investment banks and hedge funds both need to be encouraged to stress test their portfolios for an event like this, allowing for worst-case knock-on effects. If the size of position closures required is a large proportion of daily trading volume, a severe liquidity crisis could emerge. Investment banks in particular need to ensure that their capital remains sufficient to cover such a contingency.