VAR breakdown

Value-at-risk at the world's largest financial institutions rose modestly last year in a relatively benign market environment. But some parties are worried about the low number of reported VAR back-test exceptions. By ***Christopher Jeffery****, with research by* ***Xiao-Long Chen***

Average value-at-risk at the world's leading financial institutions rose by just 1.2% last year in dollar terms to an average of $51.9 million using a one-day holding period at the 99% confidence level for our sample of 25 dealers (see table A). Year-end VAR levels, meanwhile, rose by an average 8.7% to $51.6 million (see table B).

The modest gains occurred in an environment of positive investor sentiment. Notably, equity markets performed strongly against a backdrop of strong corporate earnings. And, despite short-term rate hikes, long-term rates throughout most of the world ended the year at relatively low levels. In the currency markets, meanwhile, the dollar appreciated against other major currencies – it was up 14.3% against the euro, 15.2% against the Swiss franc, while sterling slipped 10.3% against the greenback – but this trend diminished towards the end of last year. However, the strength of the dollar does skew downwards the results of European institutions that do not report in dollars.

While there was some turbulence – caused by credit rating downgrades in the US automotive sector in the second quarter of last year, higher commodity prices and a severe hurricane season in the US – this relatively benign market environment allowed dealers to crank up their market risk exposures. This occurred most notably at Wall Street securities dealers that have typically had relatively stable VAR levels.

Bear Stearns, which removed its commodity sub-segment from its reported VAR figures last year due to their "immateriality", saw its year-end risk shoot up 44.6% to $30.3 million and its average VAR rise by nearly 30% to $29 million. Previously, the fixed-income specialist's VAR had been bounded in a tight range, with its fluctuations described in 2003 by Robert Neff, former head of market risk, as "noise". Neff said Bear Stearns, Lehman Brothers and Morgan Stanley rarely saw their VAR figures move significantly, unlike other dealers such as JP Morgan and Goldman Sachs.

But in its 2005 annual filings Bear Stearns says: "Market conditions were favourable for the company's trading activity in both its fiscal years ending November 30, 2005 and 2004. Hedging strategies were generally effective as established trading relationships remained substantially intact and volatility tended to be lower than historical norms."

A Bear Stearns official says the increase did not represent a shift in policy. "To some extent, it reflects nothing more than our keeping VAR to capital roughly constant," he says. Bear Stearns' average VAR by market capital rose by 8.9% last year.

The official adds: "In addition, markets were a bit more volatile in 2005 than previously – for example, we saw sharp moves in credit markets in May – which

pushes the VAR up even without changes in positions."

The situation was similar at Lehman Brothers and, to a lesser extent, at Morgan Stanley and Merrill Lynch. "Average VAR for 2005 of $31.4 million [at the 95% confidence level, or $44.5 million at the 99% level] increased from $26.8 million [or $38 million at the 99% level] for the comparable 2004 period reflecting the increased scale of our fixed-income and equity capital markets businesses, as well as a lower diversification benefit across businesses," says Lehman Brothers' annual report. But the dealer, which included a commodities category for the first time, did not elaborate further. Its year-end VAR rose by 28% to $50.7 million.

Merrill Lynch reports in its filing that trading VAR increased in 2005 due to increased interest rate and credit spread and equity exposures. "If market conditions are favourable, Merrill Lynch may increase its risk-taking in a number of businesses, including certain proprietary trading activities and principal investments. These activities provide revenue opportunities while also increasing the loss potential under certain market conditions," Merrill Lynch adds.

Morgan Stanley's 16% rise in average VAR, meanwhile, was the result of increases in its rates, credit spread and commodity price exposures. "The increase in interest rate and credit spread VAR was predominantly driven by increased exposures to credit-sensitive instruments (for example, corporate debt securities) and to interest rate levels," Morgan Stanley says.

Goldman Sachs, which has seen its VAR numbers swing significantly during the past few years as it has sought to take advantage of market opportunities, also saw its year-end VAR numbers surge by 26% to hit $117.5 million – the highest in the world after Switzerland's UBS. Its average VAR grew at a slower rate to hit $99.1 million, up 4.5%. "The increase was primarily due to higher levels of exposure to commodity prices, equity prices and interest rates, partially offset by reduced exposures to currency rates, as well as reduced volatilities, particularly in interest rate and equity assets," Goldman Sachs says in its 2005 annual filings.

A. Average VAR, one-day, 99%

Financial institution	2005	2004	Change in VAR	Change in reporting currency VAR	VAR rank 2005	VAR rank 2004	VAR rank 2003
	($m)[1]	($m)[2]	(%)	(%)[3]			
UBS [4]	122.8	95.2	29.0	32.5	1	2	1
Citigroup	109.0	101.0	7.9		2	1	3
Goldman Sachs	99.1	94.9	4.5		3	3	2
JP Morgan [5]	86.0	85.0	1.2		4	5	4
Morgan Stanley	85.0	73.0	16.4		5	6	7
Deutsche Bank	83.5	87.4	-4.5	-8.2	6	4	6
ABN Amro	63.4	32.2	97.1		7	17	19
Bank of America	62.2	48.0	29.6		8	11	13
Barclays	62.1	71.7	-13.5	-7.0	9	7	9
Commerzbank	60.4	64.8	-6.8	-3.1	10	8	5
Credit Suisse	54.2	55.6	-2.6	0.0	11	9	8
Merrill Lynch	53.8	49.6	8.6		12	10	12
Lehman Brothers	44.5	38.0	17.2		13	14	15
HSBC	37.3	35.6	4.8		14	15	14
ING	35.5	30.1	18.0	13.4	15	18	16
RBS	33.5	28.3	18.4	20.4	16	20	20
BNP Paribas	29.7	38.8	-23.5	-20.4	17	13	11
Bear Stearns	29.0	22.4	29.7		18	23	21
Santander	26.5	n/a	n/a		19	n/a	n/a
BBVA	24.2	n/a	n/a		20		
SG	24.1	29.3	-17.6	-20.8	21	19	17
Wachovia	24.1	23.5	2.7		22	22	24
WestLB	21.7	32.3	-33.0	-30.3	23	16	18
Dresdner	19.7	39.6	-50.3	-48.4	24	12	10
Lloyds TSB	5.4	3.1	72.2	75.0	25	26	27
Average	51.9	51.3	1.2				

Note 1 $1=Sfr1.228, $1=€0.791, $1=£0.552
Note 2 $1=Sfr1.119, $1=€0.758, $1=£0.541
Note 3 Not relevant for institutions that report in US dollars, including HSBC
Note 4 UBS 2005 figures reported at one-day holding period, 2004 figures converted to one-day holding period
Note 5 Trading VAR

Rates, equities, commodities

Although Wall Street securities dealers Bear Stearns and Merrill Lynch were both in the top five for the largest increases in interest rate VAR – Bear Stearns' rates VAR rose by 46.3% to $31.3 million, while Merrill Lynch's increased by 42.9% to $56.6 million – Dutch institutions ING and ABN Amro saw the largest material increases in percentage terms (see table C).

ING's interest rate VAR grew by 58.3% to $26.6 million. But its results were immaterial as it cut a VAR section called high yield/emerging markets from its calculations in 2004, which amounted to $8.2 million. Once the 2004 interest rate figure was adjusted to account for this, its rates VAR grew by just 10.5%. ABN Amro's average rates VAR, meanwhile, rose by 46.8% to $38.6 million, although it provided no explanation for this increase in its accounts.

A number of other European institutions, by contrast, saw their interest rate VAR levels fall significantly. These included: Dresdner Bank (–49.4%), Société Générale (–41.0%), Royal Bank of Scotland (–37.5%), WestLB (–34.2%) and BNP Paribas (–23.2%). While Dresdner Bank's parent Allianz has scaled back a number of its investment banking activities since it bought the German bank in 2001, there is no explanation in any of the banks' filings to explain the fall in VAR.

By contrast, Swiss dealers provide significantly more information about their changes in VAR. "Credit spread exposures remained the dominant element of interest rate VAR, but fluctuations in the level of risk throughout the year were driven by our outright interest rate exposures," UBS says in its filings. "These exposures varied in both amount and direction over the year as we actively managed our risk in response to market conditions. Interest rate VAR ended the

year at Sfr269 million, a significant decrease on the 2004 year-end VAR of Sfr361 million, reflecting uncertainty about the longer term."

ABN Amro's equity VAR shot up by 136.7% in US dollar terms to $46.7 million (see table D). "The approved VAR methodology that we were using in 2005 significantly overstated the market risk on certain trading activities within our equity business," says Graham Bird, chief risk officer for global markets at ABN Amro. "The trading environment for these strategies was attractive in 2005 and our activity level related to this was a major factor in the observed VAR increase."

Bird adds that ABN Amro has agreed a number of changes to its VAR model with its Dutch supervisor this year. "These changes, designed to make the bank's VAR more responsive to market conditions, include a shorter historic data series, graduated weighting of data and a move to absolute rather than relative shifts for certain asset classes," says Bird. "These changes are likely to reduce the overstatement of market risk previously referred to, but not fully eliminate it."

UBS also set the standard in Europe for disclosure about its equities exposures, which rose by 86.5% between the end of 2004 and the end of 2005. "Equities risk in particular increased year on year, ending the year at Sfr235 million, compared with Sfr126 million at the end of 2004," the dealer's annual report says. "Much of this increase was a response to good trading conditions, particularly in the latter part of the year – greater market volatility, increases in major indexes, many of which reached annual highs in the fourth quarter, heavy trading volumes, and strong new issuance and mergers and acquisitions activity. We were able to capitalise on these conditions in both client business and proprietary business."

Meanwhile, Morgan Stanley topped the table for the largest average risk exposure to commodities in 2005 (see table E). Its commodities business, which acts as a strong diversifier to its other exposures, saw its VAR rise by 15.2% to $38 million. "The increase in commodity price VAR was predominantly driven by increased exposures to energy (that is, natural gas and electricity) and oil products (that is, crude and distillates)," the US securities dealer says in its filing.

JP Morgan, which saw its commodities VAR increase by 141.1% to $21 million, provided less detail. "Commodities and other VAR increased due to the expansion of the energy trading business," the JP Morgan report says. And Merrill Lynch, which completed its integration of Entergy-Koch Trading in November 2004, saw its average commodities VAR rise by 303.6% to $11.3 million.

Overall, the increase in exposures to commodities rose by 25.2% for the 13 institutions that broke out commodities figures. Only Citigroup reported an average fall – down 6.3% to $15 million. Meanwhile, Goldman Sachs' year-end commodities VAR plummeted by 43.1% to $25.5 million at the 99% confidence level.

B. Year-end VAR, one-day, 99%

Financial institution	2005	2004	Change in VAR	Change in reporting currency VAR	VAR rank 2005	VAR rank 2004	VAR rank 2003
	($m)[1]	($m)[2]	(%)	(%)[3]			
UBS [4]	117.9	92.2	27.8	47.2	1	3	1
Goldman Sachs	117.5	93.5	25.7		2	2	3
JP Morgan [5]	103.0	72.1	42.9		3	6	2
Citigroup	93.0	116.0	-19.8		4	1	4
Deutsche Bank	82.7	91.6	-9.7	5.4	5	4	5
Morgan Stanley	82.0	80.0	2.5		6	5	7
Credit Suisse	66.6	55.1	20.8	31.9	7	8	10
Commerzbank	58.0	43.8	32.4	55.2	8	9	6
Merrill Lynch	56.6	59.5	-4.8		9	7	9
ABN Amro	51.7	42.2	22.6	43.3	10	10	n/a
Lehman Brothers	50.7	39.5	28.3		11	11	14
BNP Paribas	33.7	26.7	26.3	47.5	12	16	17
HSBC	32.7	37.7	-13.2		13	12	12
Santander	32.0	n/a	n/a		14=	n/a	n/a
ING	32.0	35.3	-9.4	5.9	14=	13	16
RBS	31.2	27.9	11.5	24.3	16	15	20
Bear Stearns	30.3	21.0	44.6		17	22	19
Dresdner	24.7	21.9	13.0	32.0	18	21	11
BBVA	24.2	n/a	n/a		19	n/a	n/a
Wachovia	22.6	26.4	-14.4		20	17	21
SG	22.5	31.8	-29.3	-17.4	21	14	15
WestLB	18.4	24.6	-25.2	-12.6	22	19	13
Lloyds TSB	2.7	2.4	9.6	22.2	23	25	25
Average	51.6	49.6	8.7				

Note 1 $1=Sfr1.315, $1=€0.844, $1=£0.582
Note 2 $1=Sfr1.141, $1=€0.739, $1=£0.522
Note 3 Not relevant for institutions that report in US dollars, including HSBC
Note 4 UBS 2005 figures reported at one-day holding period, 2004 figures converted to one-day holding period
Note 5 Trading VAR

Extra categories

A number of institutions included extra categories in addition to the standard interest rate/fixed income, foreign exchange, equities, commodities, other, diversification and total categories. Bank of America, for example included real estate/mortgages and credit as separate groupings. Its average VAR increased by nearly 29.6% to $62.2 million. "The increase in average VAR of the trading portfolio for 2005 was primarily due to increases in the average risk taken in credit due to an increase in credit protection purchased to hedge the credit risk in our commercial loan portfolio," Bank of America says in its company filings. "Average VAR for credit default swaps (CDSs) was $60.9 million and $23.5 million in 2005 and 2004. In 2005, the credit VAR was less than VAR for CDSs used for credit risk management as the positions in credit fixed income typically offset the risk of CDS. The relationship between overall credit VAR and VAR for CDSs can change over time as a result of changes in the relative sizes of the credit fixed income and CDS exposures."

The UK's Royal Bank of Scotland (RBS) and Barclays also broke out credit spread risk from the interest rate categories. RBS' average credit spread risk stood at $29.3

C. Average interest rate VAR, one-day, 99%

Rank	Financial institution	2005 ($m)[1]	2004 ($m)[2]	% Change
1	Citigroup	100	96.0	4.2
2	UBS [3]	94.2	90.4	4.2
3	Deutsche Bank	67.0	75.2	-10.9
4	JP Morgan [4]	67.0	74.4	-9.9
5	Morgan Stanley	58.0	50.0	16.0
6	Merrill Lynch	56.6	39.6	42.9
7	Goldman Sachs	52.4	51.0	2.7
8	Credit Suisse	49.5	46.1	7.4
9	Barclays	49.2	52.3	-5.9
10	ABN Amro	38.6	26.3	46.8
11	HSBC	37.3	29.0	28.6
12	Lehman Brothers	34.0	30.4	11.8
13	Bear Stearns	31.3	21.4	46.3
14	BNP Paribas	28.5	37.1	-23.2
15	ING	26.6	16.8	58.3
16	Bank of America	24.7	26.2	-5.7
17	Santander	23.1	n/a	
18	SG	21.6	36.6	-41.0
19	Dresdner	20.9	41.3	-49.4
20	Wachovia	19.0	15.4	23.4
21	RBS	18.8	30.1	-37.5
22	BBVA	15.4	n/a	
23	WestLB	14.8	22.5	-34.2
24	Lloyds TSB	4.6	2.4	91.7
	Average	39.7	41.4	-4.1

Five largest risers in percentage terms	
Financial institution	% change in 2005
Lloyds TSB	91.7
ING	58.3
ABN Amro	46.8
Bear Stearns	46.3
Merrill Lynch	42.9

Five largest fallers in percentage terms	
Financial institution	% change in 2005
Dresdner	-49.4
SG	-41.0
RBS	-37.5
WestLB	-34.2
BNP Paribas	-23.2

Note 1 $1=Sfr1.228, $1=€0.791, $1=£0.552
Note 2 $1=Sfr1.119, $1=€0.758, $1=£0.541
Note 3 Extrapolated from 10-day holding period
Note 4 Trading VAR

million compared with its interest rate risk of $18.8 million and a total average VAR of $33.5 million. It had a currency VAR of $4.6 million, an equity VAR of $1.3 million and a diversification benefit of $20.6 million. Meanwhile, Barclays' average credit spread risk stood at $44.8 million, compared with its interest rate risk figure of $49.2 million.

The separation of credit and interest rate risks also took place at Société Générale. "In the last quarter of 2005, the group divided its interest rate risk into two separate categories: interest rate risk and credit risk, in order to give a more accurate classification of its exposure," the French bank explains in its filings. Its average credit spread risk was $15.2 million and its rates VAR stood at $21.6 million. Merrill Lynch, meanwhile, removed its volatility category that it reported in 2004.

World of confusion

As always with VAR statistics, the figures can prove misleading. At a basic level, this involves dealers reporting statistics at different confidence levels, typically at the 95% or 99% levels – Morgan Stanley provides both – but also including confidence levels of 97.5% for Wachovia and 98% for Barclays. In addition, dealers report their VAR statistics using different holding periods, typically a one-day period, with some commercial banks still reporting at 10-day levels, while others select a one-week period. *Risk* converts these statistics to one-day holding periods and 99% confidence levels (see box).

However, as statistics reported by Morgan Stanley demonstrate, these conversions can provide significant errors. The bank used four years of historical data to produce its headline average trading VAR at the 99% confidence level of $85 million. When it converted its average VAR to the 95% confidence level – the confidence interval used by most securities dealers – its VAR stood at $57 million. This means Morgan Stanley's 95%-to-99% multiplier is effectively 1.491 times, rather than the 1.416 times implied by a normal distribution and used in *Risk*'s study. This so-called 'fat tail', associated with the likelihood of higher than normally distributed losses for extreme events, could suggest that Goldman Sachs, Merrill Lynch, Lehman Brothers and Bear Stearns all have higher VAR numbers at the 99% level than reported in our study.

Morgan Stanley also reports its figures at a 10-day holding period, in addition to a one-day level using a four-year historical time series. At the 99% confidence level its VAR at a 10-day holding period stood at $270 million, indicating that the square-root-of-10 conversion ratio used in *Risk*'s VAR study is relatively accurate.

However, UBS also provides details of its VAR at the 10-day and one-day holding levels. And these indicate a considerable discrepancy, with its average 10-day VAR at Sfr354.6 million and its one-day figure standing at Sfr150 million – providing a conversion ratio of 4.74 compared with the 3.16 assumed in our study. As UBS says: "Ten-day and one-day VAR results are separately calculated from the underlying positions and historical market moves. They cannot be inferred from each other."

Another factor that contributes to inaccuracies in comparisons between firms stems from the time-frame used in their historical time series used to underpin their VAR calculations. Again, Morgan Stanley's results indicate the significance of dealers using a range of different times series, ranging from four-year periods to times series as short as, or significantly weighted towards, the past six months. Morgan Stanley's reported average 2005 VAR of $85 million at the 99% confidence level over four years would fall to $71 million if it replaces it with a one-year history – a drop of more than 15%.

To add to the confusion, Lehman Brothers used actual daily net trading revenues over the past 150 trading days to generate its VAR statistics. But using a model-based historical simulation using end-of day positions based on four years of historical data, weighted to give more impact to recent time periods, it offered significantly different results. "Using this model-based approach, our average firm-wide risk for 2005 declined compared with 2004, primarily due to reduced event risk, partially offset by slightly higher market risk," Lehman Brothers says.

Taking exception

Discrepancies in VAR reporting are catching the eyes of regulators. And there appears to be some criticism of accounting bodies that are failing to place sufficient emphasis on reported VAR. "Quantitative financial risk disclosures, such as value-at-risk measures for securities portfolios, have already been included in regulatory reporting requirements of financial firms for which this type of risk has been more important," says the Bank for International Settlements in its seventy-sixth annual report, which was published on June 26. "Accounting standard setters, too, have been paying more attention to risk disclosures that are consistent with, but arguably less ambitious than, those of prudential authorities."

A case in point stems from the number of exceptions reported by financial institutions. *Risk*'s 2005 VAR survey covered 25 financial institutions from around the world. At a one-day, 99% confidence level, these institutions would statistically expect to have a VAR exception on between two to three days a year – or every one in 20 days at the 95% confidence level used by most US securities dealers on a hypothetical basis.

This implies there should be between 50 and 100 VAR exceptions in 2005 at the 99% confidence level – and up to a possible 625 at the 95% confidence level – assuming the models are working correctly. In fact, only two exceptions were recorded: one happened at Deutsche Bank and the other at Dresdner Bank. The latter provided no explanation for its outlier, but Deutsche Bank gave the following explanation: "In our regulatory back-testing in 2005, we observed one outlier, that is, a hypothetical buy-and-hold loss that exceeded our value-at-risk estimate for the trading units as a whole. This is below the two to three outliers a year that are statistically expected when using a 99% confidence level value-at-risk model. The outlier occurred in April, when the actual trading loss was €52 million driven by exceptionally high levels of volatility both in corporate bond and equity markets."

In *Risk*'s 2004 VAR survey, the number of exceptions was also low. Only ABN Amro, Credit Suisse and Goldman Sachs reported in their accounts that they had experienced a tail event. So why are only five exceptions recorded in two years when, statistically, the number should be far higher?

Were dealers to use 'clean' profit and loss (P&L) information – which freezes their portfolios and strips out fee income – when back-testing their VAR models, then it would appear their models are too conservative, as a model using uncontaminated P&L data should yield between two and three exception per year. However, back-tests reported in annual reports – and, according to one market source, even some regulatory back-test results – typically use 'dirty' P&L, where the mark-to-market of the P&L is contaminated in some manner by the inclusion of

D. Average equity VAR, one-day, 99%

Rank	Financial institution	2005 ($m)[1]	2004 ($m)[2]	% Change		
1	Goldman Sachs	48.1	45.3	6.2	Five largest risers in percentage terms	
2	ABN Amro	46.7	19.6	136.7	Financial institution	% change in 2005
3	UBS [3]	44.8	40.7	10.1	ABN Amro	136.7
4	Deutsche Bank	42.3	37.6	12.5	Citigroup	37.9
5	Citigroup	40.0	29.0	37.9	ING	36.6
6	Morgan Stanley	35.0	34.0	2.9	Barclays Capital	30.7
7	JP Morgan [4]	34.0	28.2	20.6	Lehman Brothers	22.1
8	Credit Suisse	33.3	31.2	6.7		
9	Bank of America	18.1	21.8	-17.0	Five largest fallers in percentage terms	
10	BNP Paribas	17.7	19.6	-9.7	Financial institution	% change in 2005
11	Merrill Lynch	17.0	25.5	-33.3	Bear Stearns	-36.9
12	Lehman Brothers	16.6	13.6	22.1	Merrill Lynch	-33.3
13	SG	14.0	14.6	-4.1	RBS	-18.8
14	Wachovia	13.1	13.3	-1.5	Bank of America	-17.0
15	ING	12.7	9.3	36.6	WestLB	-16.0
16	Barclays	11.5	8.8	30.7		
17	Dresdner	7.6	8.3	-8.4		
18	WestLB	6.8	8.1	-16.1		
19	HSBC	5.5	5.2	5.8		
20	Santander	4.4	n/a			
21	Bear Stearns	4.1	6.5	-36.9		
22	BBVA	2.7	n/a	n/a		
23	RBS	1.3	1.6	-18.8		
24	Lloyds TSB	0.0	0.0	-		
	Average	19.9	17.5	13.5		

Note 1 $1=Sfr1.228, $1=€0.791, $1=£0.552
Note 2 $1=Sfr1.119, $1=€0.758, $1=£0.541
Note 3 Extrapolated from 10-day holding period
Note 4 Trading VAR

E. Average commodity VAR, one-day, 99%

Rank	Financial institution	2005 ($m)[1]	2004 ($m)[2]	% change		
1	Morgan Stanley	38.0	33.0	15.2	Five largest risers in percentage terms	
2	Goldman Sachs	36.8	28.3	30.0	Credit Suisse	783.3
3	JP Morgan [3]	21.0	8.7	141.4	ABN Amro	400
4	Citigroup	15.0	16.0	-6.3	Merrill Lynch	303.6
5	Barclays	13.2	12.5	5.6	Wachovia	200
6	Merrill Lynch	11.3	2.8	303.6	JP Morgan 3	141.4
7	Deutsche Bank	8.9	8.5	4.7		
8	Bank of America	6.6	6.5	1.5		
9	Credit Suisse	5.3	0.6	783.3		
10	BNP Paribas	4.4	3.3	33.3		
11	SG	2.5	2.4	4.2		
11	ABN Amro	2.5	0.5	400.0		
12	Dresdner	1.2	n/a	0.0		
13	Wachovia	0.6	0.2	200.0		
	Average	12.9	10.3	25.2		

Note 1 $1=Sfr1.228, $1=€0.791, $1=£0.552
Note 2 $1=Sfr1.119, $1=€0.758, $1=£0.541
Note 3 JP Morgan's commodity VAR includes 'other'

F. Average VAR/tier-one capital

Rank	Financial Institution	Average 2005 VAR/ average 2005 tier-one capital (x 10^{-3})	Average 2004 VAR/ average 2004 tier-one capital (x 10^{-3})	% change on 2004	Rank 2004		
1	UBS	4.2	3.7	13.6	2	Three largest gainers	
2	Commerzbank	4.2	4.7	-11.3	1	Lloyd TSB	75.6
3	Deutsche Bank	3.2	3.3	-1.4	3	ABN Amro	65.3
4	Santander	2.8	n/a		-	UBS	13.6
5	Credit Suisse	2.6	2.8	-5.8	5		
6	WestLB	2.6	3.2	-18.9	4	Three largest fallers	
7	Dresdner	2.2	4.4	-49.0		Dresdner	-49.0
8	ABN Amro	2.1	1.3	65.3	10	BNP Paribas	-25.0
9	Barclays	1.9	2.5	-21.7	6	Barclays Capital	-21.7
10	Citigroup	1.4	1.4	0.1	9		
11	ING	1.3	1.1	11.0	12		
12	BBVA	1.2	n/a		-		
13	JP Morgan	1.2	1.5	-19.8	8		
14	SG	1.0	1.3	-19.6	11		
15	Bank of America	0.9	0.9	4.4	14		
16	BNP Paribas	0.9	1.1	-25.0	13		
17	Wachovia	0.8	0.9	-8.4	15		
18	RBS	0.7	0.7	-0.9	16		
19	HSBC	0.5	0.6	-9.0	17		
20	Lloyds TSB	0.3	0.1	75.6	18		
	Average	1.8	2.0	-8.3			

G. Average VAR/ market capitalisation

Rank	Financial institution	Average 2005 VAR/ average 2005 market cap (x 10^{-3})	Average 2004 VAR/ average 2004 market cap (x 10^{-3})	% change	Rank in 2004		
1	Commerzbank	3.64	5.34	-31.9	1		
2	Bear Stearns	1.91	1.76	8.9	4	Five largest risers in percentage terms	
3	Goldman Sachs	1.64	1.83	-10.3	2	ABN Amro	75.1
4	Deutsche Bank	1.63	1.80	-9.5	3	Lloyds TSB	66.7
5	Lehman Brothers	1.56	1.74	-10.7	5	Morgan Stanley	29.0
6	Morgan Stanley	1.49	1.24	20.0	6	UBS	15.6
7	UBS	1.37	1.19	15.7	9	RBS	12.6
8	ABN Amro	1.33	0.76	75.1	12=		
9	Credit Suisse	0.97	1.14	-14.9	8	Five largest fallers in percentage terms	
10	Merrill Lynch	0.91	1.07	-14.9	10	Dresdner	-57.2
11	Barclays	0.88	1.10	-20.0	7	Commerzbank	-31.9
12	JP Morgan	0.62	0.80	-21.9	11	SG	-30.1
13	ING	0.50	0.52	-4.2	15	BNP Paribas	-29.8
14	SG	0.49	0.70	-30.1	12=	JP Morgan	-21.9
15	BNP Paribas	0.45	0.64	-29.8	14		
16	Citigroup	0.44	0.40	9.7	16		
17	BBVA	0.40	n/a	-	-		
18	Dresdner	0.35	0.81	-57.2	-		
19	Bank of America	0.33	0.31	5.7	17=		
19	RBS	0.33	0.29	12.6	17=		
19	Santander	0.33	n/a	-	-		
22	Wachovia	0.29	0.33	-10.5	17=		
23	HSBC	0.20	0.20	2.0	18		
24	Lloyds TSB	0.11	0.07	66.7	20		
	Average	0.92	1.09	-15.4			

commissions, origination fees (so-called 'franchise P&L') and intra-day trading. As a result, reported exceptions are few and far between and represent much more significant tail events.

Overall, the increases in VAR at financial institutions were more than offset by greater proportional increases in both tier-one capital – for commercial banks – and market capitalisation. The overall average VAR divided by tier-one capital ratio fell by 8.3% last year to 1.8 times (see table F). European banks had the highest exposures, with both UBS and Commerzbank having ratios of 4.2, while Deutsche Bank had the third highest ratio at 3.2 times. The most highly geared US institution was Citigroup, which came well down the rankings at tenth.

Meanwhile, healthy profits at dealers last year resulted in improved share prices. These helped reduce total average VAR levels divided by market capitalisation by 15.4% in dollar terms to $0.92 times. German banks and US securities dealers filled the top spots. Commerzbank topped the gearing league with a ratio of 3.64 times, despite a 31.9% fall in gearing compared with 2004. Bear Stearns, Goldman Sachs, Deutsche Bank and Lehman Brothers filled out the next four places. ■

How Risk compiles VAR statistics

Risk converts VAR statistics to a one-day holding period and a 99% confidence interval, assuming a normal distribution. So, a VAR statistic reported at a 95% confidence interval over a 10-day holding period would be first converted to a 99% confidence level using a multiplier of 1.416, and then reduced to a one-day holding period by dividing by the square root of 10.

Risk does not attempt to smooth VAR statistics reported using different historical sets of data. This can have a material impact on the results. Dealers using longer historical data sets tend to provide a more realistic view of their real risk exposure, but shorter data periods are a better indicator of immediate profitability.

Risk has converted all currencies to US dollars for the purposes of comparison. Since the US dollar strengthened significantly against the euro, Swiss franc and sterling last year; this can have a material impact when comparing statistics.

Risk accepts that VAR comparisons are extremely difficult between institutions that assess their market risk using different approaches. But the study of VAR statistics can illuminate interesting trends at individual dealers and for the market as a whole.