
ISDA 2004 Operations Benchmarking Survey

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INTERNATIONAL SWAPS AND DERIVATIVES ASSOCIATION, INC.

INTERNATIONAL SWAPS AND DERIVATIVES ASSOCIATION

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SECTION 1: INTRODUCTION

Since 2000, ISDA has collected data on the processing of privately negotiated—commonly known as over-the-counter (OTC)—derivatives. The Operations Benchmarking Survey summarizes the data in order to provide information firms can use to evaluate their efforts to achieve improved operational efficiency, accuracy, and reliability. The results should also provide a measure of progress toward increased automation and common operating standards.

Appendix 1 lists the firms that responded to the 2004 Survey. A total of 67 institutions responded, compared with 64 last year and 65 the year before. We classify responding firms as large, medium, or small according to weekly derivatives volume: This year’s total includes 19 large firms, 25 medium, and 23 small, with regional mixes as shown in Table 1. Of the 67 that responded, 47 are repeat participants from last year.

Table 1
Profile of responding firms
Numbers of firms

	2001	2002	2003	2004	Regional mix in 2004 Survey					
					Responded 04 & 03	North America	Africa	Asia - Pacific	Europe	Japan
Large(> 1,000 Deals)	17	20	20	19	17	8	0	1	10	0
Medium (200 - 600)	26	23	22	25	17	5	1	3	13	3
Small (0 - 200)	18	22	22	23	13	8	1	1	8	5
Total	61	65	64	67	47	21	2	5	31	8

The Survey covers five subjects: volumes and customers, operations processing, automation, staffing and organization, and market practice. The questions refer to the following product categories, defined in Appendix 2, during calendar year 2003:

- Forward rate agreements (FRAs)
- Vanilla interest rate and currency swaps (“vanilla” refers to a swap that *is capable of* being matched electronically by a commercially available auto-matching engine)
- Non-vanilla interest rate and currency swaps
- Credit derivatives
- Equity derivatives
- Interest rate options
- Currency options
- Commodity derivatives

As in past years, each firm that completes the Survey will receive an individual feedback report that compares the firm’s results with the results for respondents of similar size and with the results for the entire respondent population.

Ernst & Young, which served as consultant to this year’s Survey, collected and aggregated individual Survey responses. All data obtained from the Survey responses were kept in strict confidence and have not been shared with employees of member firms or with any other outside party. Access by ISDA staff was strictly limited. ISDA welcomes comments on the Survey and suggestions as to how it could be further improved. These can be directed to [Karel Engelen](#) in New York or [Julian Day](#) in London.

SECTION 2: SUMMARY

All 2004 Survey results are based on data for calendar year 2003.

- Over-the-counter (OTC) derivative volumes increased by 1.0 percent on average during 2003. Credit and commodity derivatives and currency options had the greatest increases, while equity derivatives had the largest decrease.
- Respondents expected a 50 percent increase in credit derivative volumes during 2004, followed by equity derivatives at 26 percent.
- About 95 percent of firms' active customers are covered by signed master agreements, compared with 90 percent last year.
- Trade data for approximately 96 percent of FRA and vanilla swap trades reach the back office on Trade Date. With the exception of credit derivatives, all trade data reach the back office by T+1.
- The proportion of credit derivatives trade data received by the back office within 1 hour grew from 8 percent last year to 24 percent this year, possibly as the result of auto-matching and affirmation solutions.
- Confirmation dispatch speed improved for vanilla products and credit derivatives. Systems and technology issues are the most common cause of delays, although requirements for tailored legal language are also a factor in slowing confirmations for more complex trades.
- Vanilla swap auto-matching remained steady at 7 percent, while auto-matching for credit derivatives made its debut at 4 percent.
- Settlement volumes increased by 20 percent during 2003. Time to resolve Nostro breaks increased significantly, especially for credit derivatives.
- There was a small improvement in the levels of automation for various trade processes for each asset class, but credit derivatives underwent significant improvement. The latter was likely the result of two automation initiatives for credit derivatives going live in 2003.
- Widespread adoption of FpML promises to be of particular value to firms in automating the matching of confirmation details. About 80 percent of those who have adopted FpML plan to increase usage over the next 12 months.
- Staff turnover remains approximately constant at around 20 percent.
- Firms report an increased level of flexibility regarding signing counterparty confirmations; that is, there has been an increase in the number of firms that will consider a trade or set of trades on their own merits. Respondents continue to eliminate reset notices.

SECTION 3: SURVEY RESULTS

PART 1 – VOLUMES AND CUSTOMERS

The Survey requested participants to give weekly volumes of all OTC derivatives deals averaged over the 12 months of calendar year 2003. We asked respondents to exclude internal and intra-company deals, and to count a deal as a single transaction even if it generates several separate tickets that need to be processed. Table 1.1 shows an average weekly deal volume of 1,195 compared with 1,187 last year, an increase of less than 1.0 percent. Note that individual product volumes do not add up to Total OTC Derivatives volume; the reason is that respondents were asked to report individual and total volumes separately without requiring that the two be tied. Volumes decreased for equity derivatives and slightly for FRAs but increased for all other categories, especially credit and commodity derivatives and currency options. The significant increase in commodity derivatives was largely the result of the addition of some high volume firms. Table 1.2 shows that firms continue to make substantial use of trades arranged through a broker.

Chart 1.1 on the following page shows weighted average expectation of future volumes. Credit derivatives lead, with respondents expecting over 50 percent growth on average. Next come equity and commodity derivatives and currency options, which firms expect to grow by around 25 percent. Finally, interest rate forwards, swaps, and options are expected to show more moderate growth.

Table 1.1
Average reported weekly deal volume
Number of trades

	All respondents				Large Firms				Medium Firms				Small Firms			
	2001	2002	2003	2004	2001	2002	2003	2004	2001	2002	2003	2004	2001	2002	2003	2004
FRAs	59	64	66	62	117	122	106	120	39	40	61	47	7	18	12	12
Vanilla swaps	209	257	236	288	571	657	564	749	96	94	127	134	30	24	32	33
Non-vanilla swaps	80	40	51	58	241	85	122	141	16	21	19	26	7	6	8	12
IR options	33	40	51	61	89	97	126	162	13	17	18	25	5	8	8	6
Currency options	251	238	427	559	696	503	1,191	1,555	112	193	96	132	10	27	33	21
Credit derivatives	26	38	79	103	56	92	191	283	4	11	15	13	3	2	8	7
Equity derivatives	149	166	291	153	406	331	606	364	27	36	102	64	11	112	22	21
Commodity derivatives	120	150	245	312	264	324	462	568	35	27	15	35	0	0	5	62
Total OTC derivatives	689	803	1,187	1,195	1,975	1,900	3,248	3,704	286	384	378	414	57	166	86	79

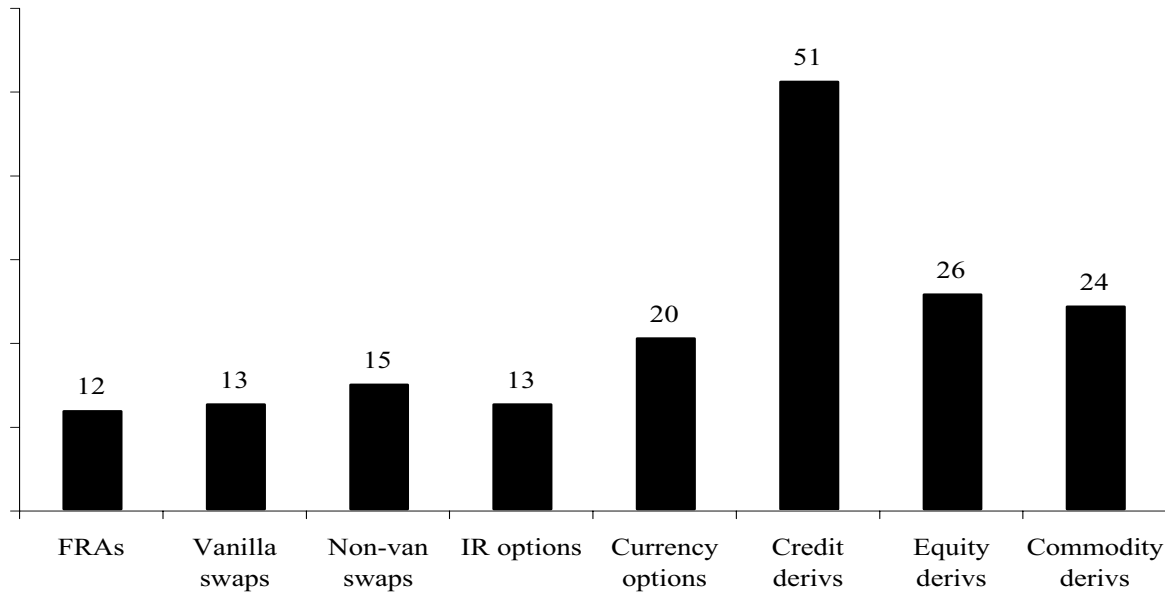
Table 1.2
Percent of trades arranged by a broker

	2001	2002	2003	2004
FRAs	56	55	66	67
Vanilla swaps	46	43	49	40
Non-vanilla swaps	13	33	23	24
IR options	38	36	34	34
Currency options	37	37	24	20
Credit derivatives	29	35	39	34
Equity derivatives	11	27	14	18
Commodity derivatives	47	31	30	56

Chart 1.1

Expectations regarding future volumes

Percent expected growth, weighted by response rate



Customers and master agreements. Respondents report a small (3 percent) overall increase in customers with whom they transact OTC derivatives business, although large and small firms actually report decreases (Table 1.3). Along with mergers, counterparty numbers likely decreased as the result of ‘clean up’ of client accounts to eliminate inactive counterparties and those for which documentation is insufficient to meet local due diligence requirements.

Table 1.3

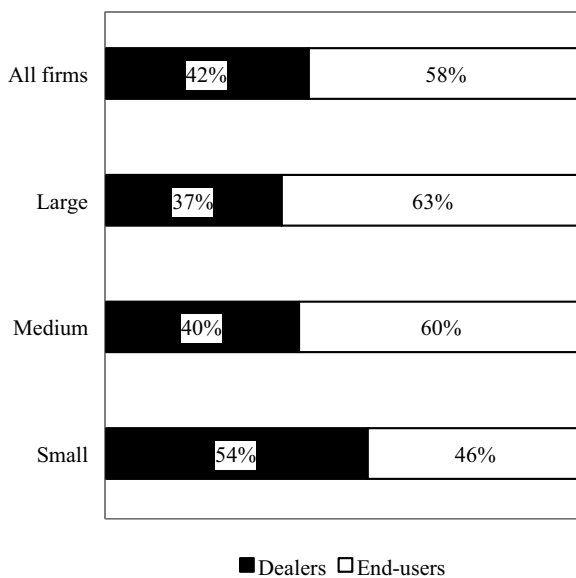
Average number of swap counterparties

	2001	2002	2003	2004
Large	4,588	4,273	4,304	3,941
Medium	1,707	1,462	1,309	1,776
Small	605	627	979	882
All Firms	2,060	2,009	2,162	2,232

Responding firms report they have signed master agreements in place with over 95 percent of active OTC derivative counterparties, compared with about 90 percent last year; in this Survey, an “active” counterparty is one with which a respondent institution had at least one trade during 2003. The high coverage reflects some variation among size classes, however. Large and medium firm coverage, for example, is closer to 90 percent because they might allow some trading prior to execution of a signed master agreement. Small firms, in contrast, show virtually complete coverage, reflecting their tendency not to allow trading before the master agreement is in place. Chart 1.2 shows that end users are a larger percent of counterparties at large and medium firms than they are at small firms.

Chart 1.2

Mix of dealers and end-user counterparties



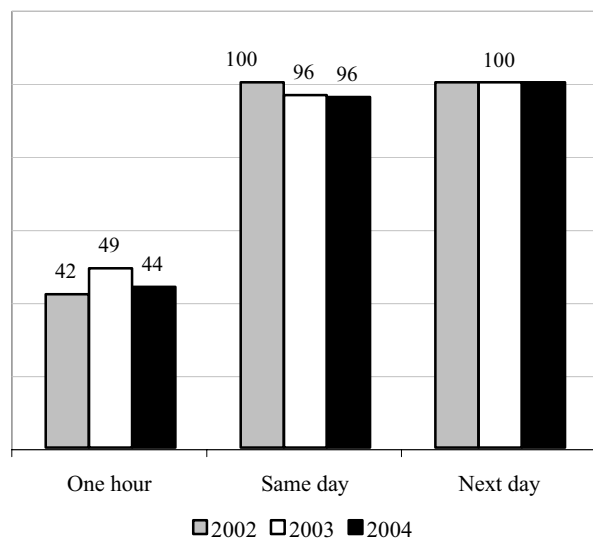
PART 2 - OPERATIONS PROCESSING

Trade data capture

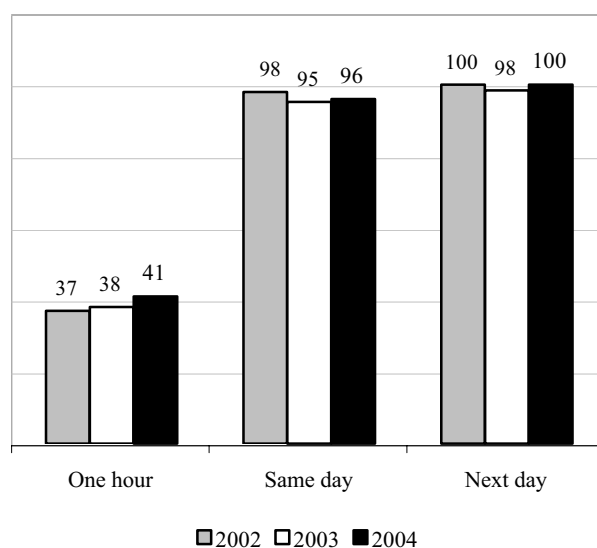
Time to receipt of trade data. The Survey asked participants about how long it normally takes for front office to get trade details to back office operations for processing. Charts 2.1a-h compare the cumulative percent of trades for which details are ready after one hour, the same day, or the next day. Three salient points stand out. First, trade data reaches the back office by T+1 for all products save credit derivatives, for which 2 percent take longer (Chart 2.1c). Second, approximately 96 percent of FRA and vanilla swap trade data reach the back office on the same day. And third, the proportion of credit derivative trade data received in one hour grew from 8 percent in last year's Survey to 24 percent in the 2004 Survey.

Charts 2.1
Time until trade details are ready for processing

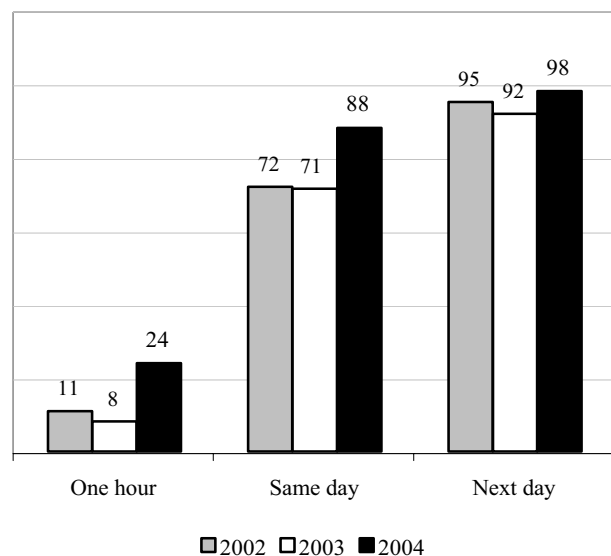
2.1a Forward rate agreements



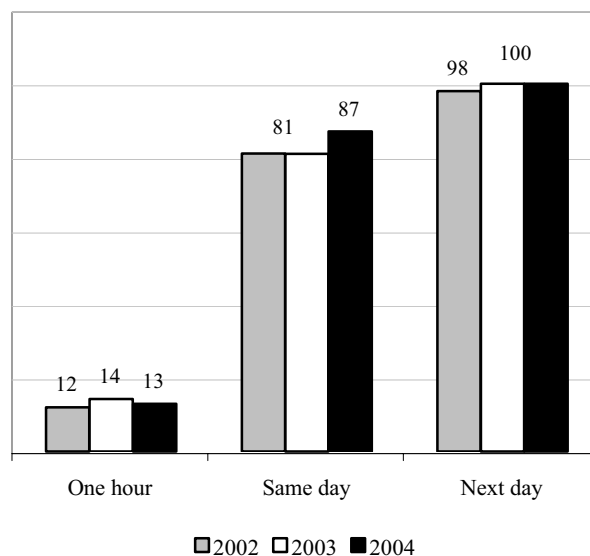
2.1b Vanilla swaps



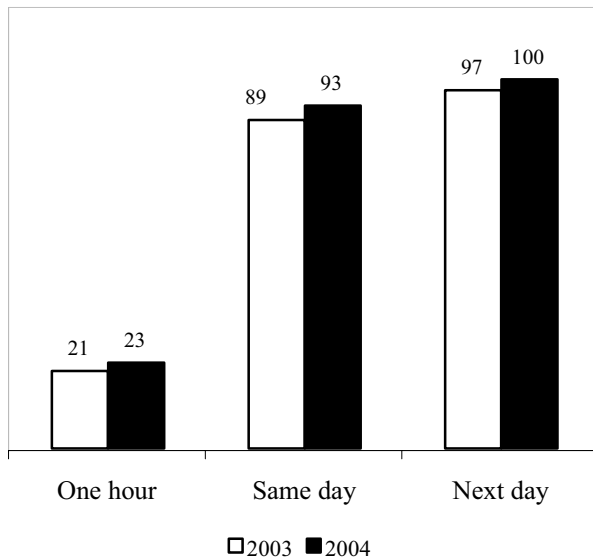
2.1c Credit derivatives



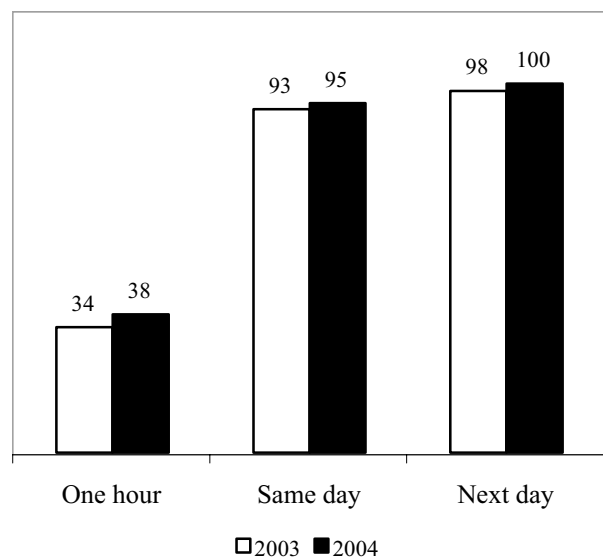
2.1d Equity derivatives



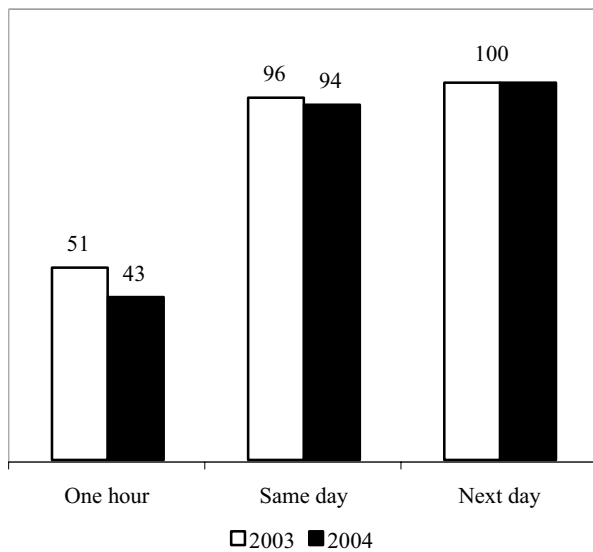
2.1e. Non-vanilla swaps



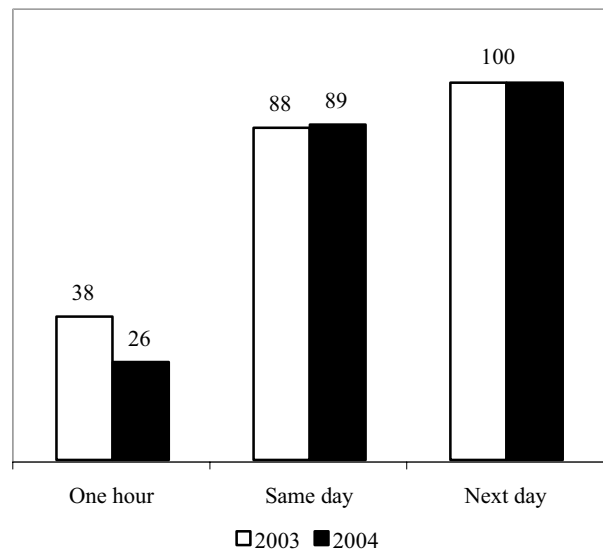
2.1f. Interest rate options



2.1g. Currency options



2.1h. Commodity derivatives



Errors in trade data entered by front office. Table 2.1 shows average error rates associated with traders entering erroneous data into deal tickets, where error rates are expressed as percent of ticket volume. This year's Survey shows a reduction in front office errors for most products, especially for vanilla swaps.

Table 2.1
Average front-office error rates
Percents

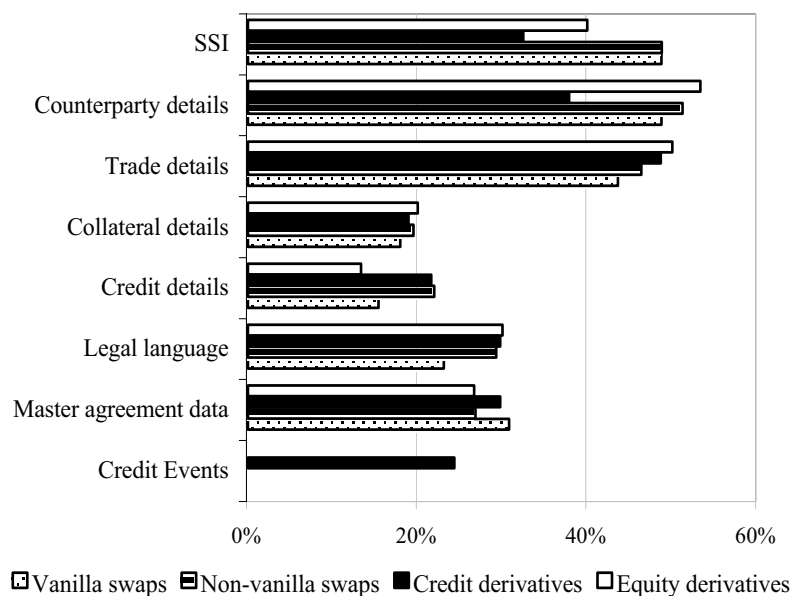
	All respondents			Large firms			Medium firms			Small firms		
	2002	2003	2004	2002	2003	2004	2002	2003	2004	2002	2003	2004
FRAs	10	9	5	10	10	7	11	10	4	8	6	3
Vanilla swaps	17	13	8	17	19	12	18	9	6	17	10	6
Non-vanilla swaps		14	13		20	17		10	13		13	9
Interest rate options		12	8		17	12		9	6		11	7
Currency options		8	6		8	9		6	6		9	3
Credit derivatives	21	20	18	14	28	26	29	11	17	27	20	9
Equity derivatives	19	13	13	18	18	16	28	8	18	13	13	8
Commodity derivatives		10	10		8	14		15	7		6	12

Additional trade data needed to process deal tickets. The Survey also asked about omitted trade details that routinely have to be added to front office trade records in order for deals to be processed. Some details—standard settlement instructions (SSI), master agreement data, and legal language, for example—might routinely be left blank by front office for operations to fill in. Other details—such as collateral or credit details—might be furnished by the collateral management or credit function. And still others—such as trade or counterparty details—might be inadvertently omitted by front office. Chart 2.2 shows the frequency of omitted details for four of the products surveyed. When details have to be added downstream, they are most likely to be trade details, counterparty details, or SSI.

Chart 2.2

Types of data omitted

Percent of respondents indicating that type is routinely omitted by front office



Rebooking trades. Finally, the Survey asked participants for the percent of trade records that need to be rebooked, whether as a result of an error or a change in trade details (Table 2.2). Rebooking is significant from a risk management point of view because it implies that the trade data entered into the accounting and risk management systems are in error and therefore give an inaccurate picture of risk exposure. This year’s Survey showed an overall decrease in the need to rebook trades.

Table 2.2

Percent of trades that need to be rebooked

	All respondents			Large firms			Medium firms			Small firms		
	2003	2004	2004	2002	2003	2004	2002	2003	2004	2002	2003	2004
FRAs	9	12	4	13	12	7	6	6	4	6	7	3
Vanilla swaps	12	16	8	21	17	12	9	8	6	13	11	6
Non-vanilla swaps	12	16	10		17	17		8	13		11	9
Interest rate options	11	13	7		14	12		6	6		12	7
Currency options	6	13	7		6	9		6	6		9	3
Credit derivatives	14	12	9	17	22	26	5	7	17	21	14	9
Equity derivatives	11	11	11	16	16	16	15	6	18	8	12	8
Commodity derivatives	8	7	8		11	14		6	7		3	12

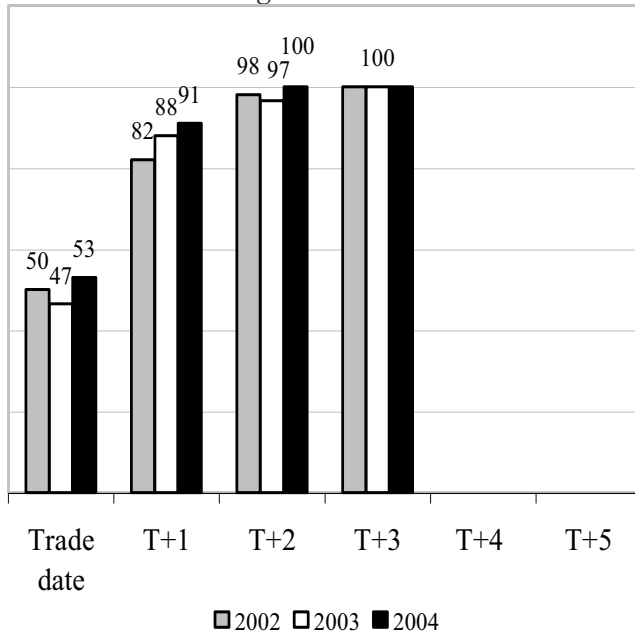
Confirmations

Production of confirmations. Charts 2.3a–h show times to dispatch of confirmations; each bar on the chart shows the cumulative percent of confirmations dispatched by the date indicated. FRAs show a 6 percent improvement in percent of confirmations dispatched on trade date (Chart 2.3a), while vanilla interest rate swaps show an 8 percent improvement (Chart 2.3b). In contrast, non-vanilla swaps dispatched on trade date have dropped since 2002 (Chart 2.3c). The reason for the lower performance of non-vanilla swaps might be the selection bias caused by continuing migration of complex swaps to the vanilla category as automated matching capabilities improve; those swaps that remain in the non-vanilla pool are consequently more complex on average than in preceding years. Finally, credit derivative confirmation times continue their steady improvement since the 2002 Survey.

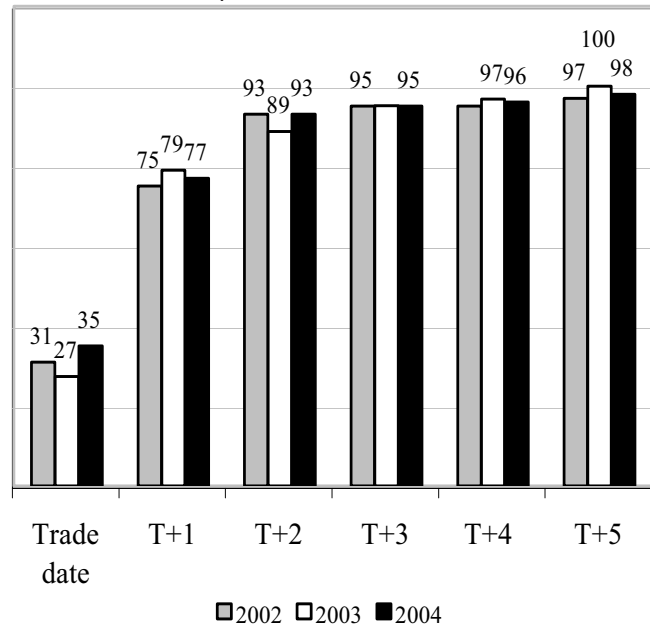
Charts 2.3

Percent of confirmations sent

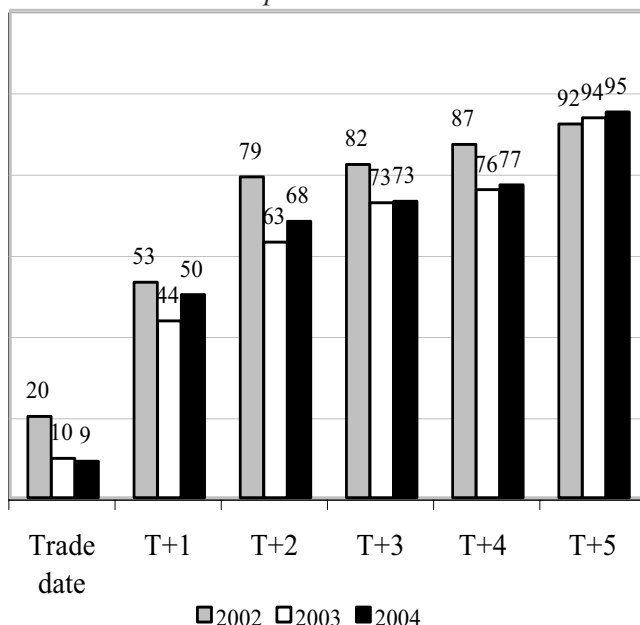
2.3a. Forward rate agreements



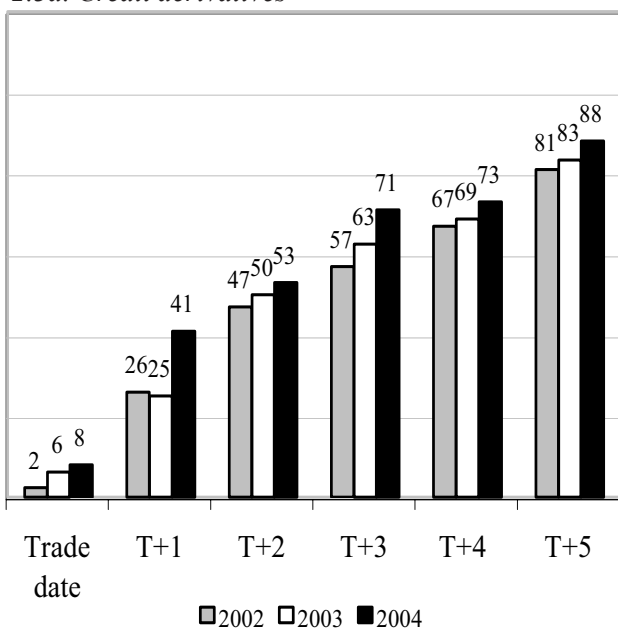
2.3b. Vanilla swaps



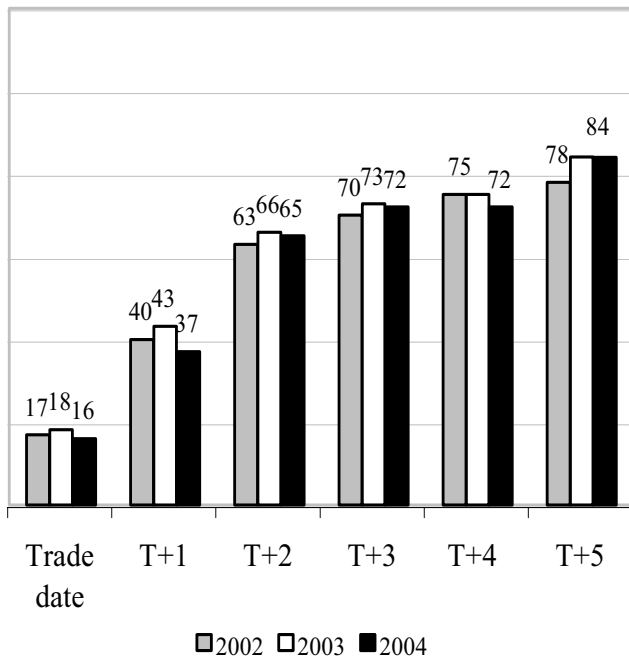
2.3c. Non-vanilla swaps



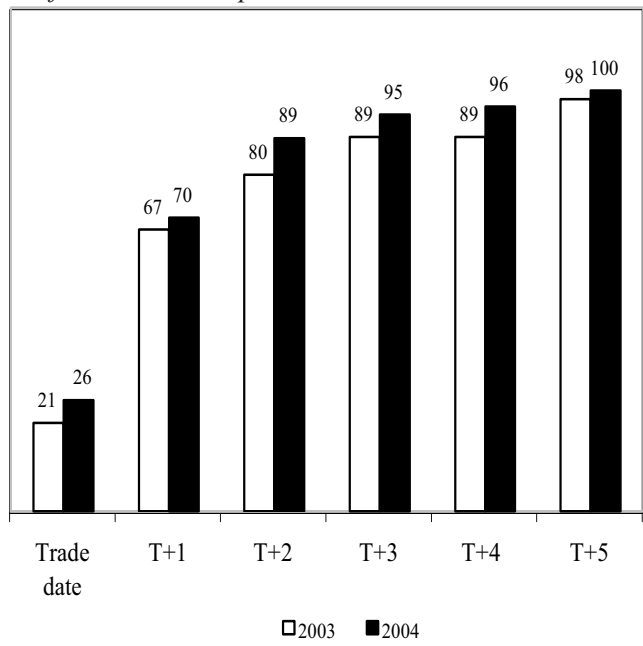
2.3d. Credit derivatives



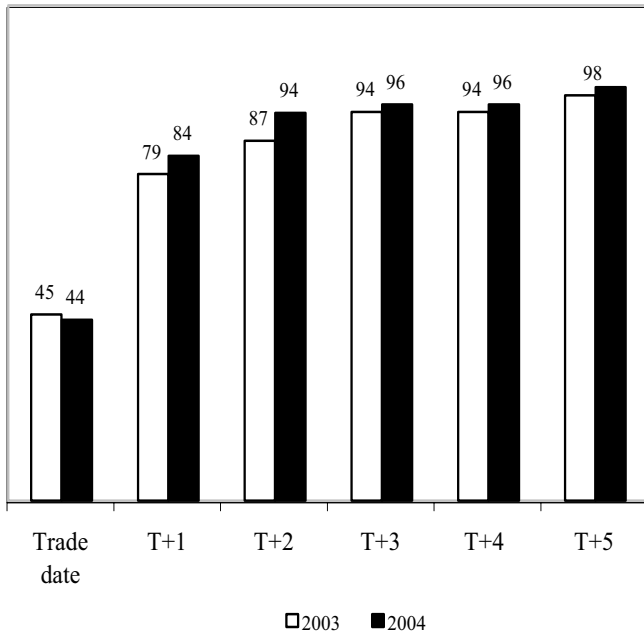
2.3e Equity derivatives



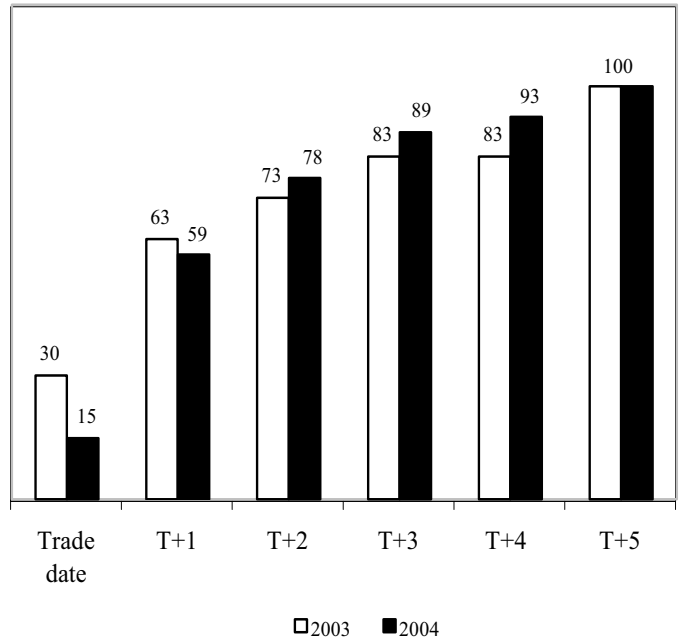
2.3f Interest rate options



2.3g Currency options



2.4h Commodity derivatives



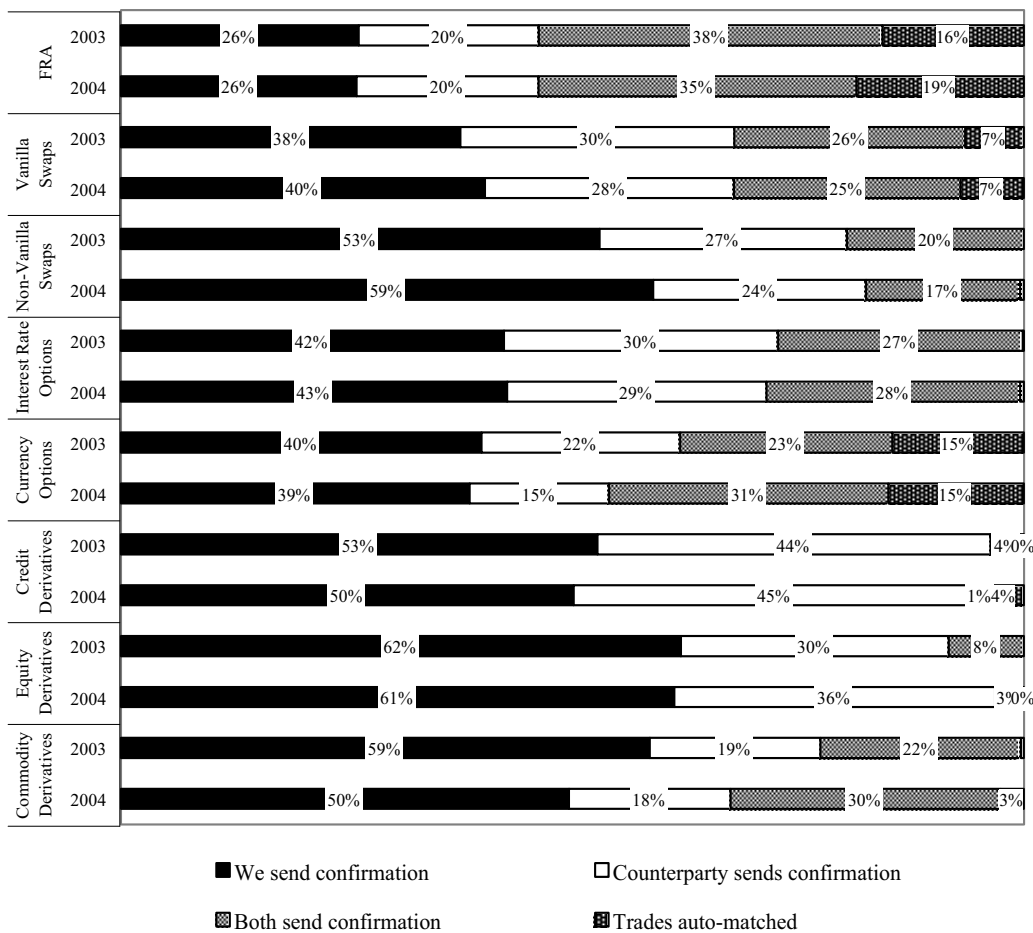
Respondents were asked to rank the reasons why confirmations do not meet their normal dispatch time. The most common cause of delay for vanilla swaps is system or technology issues; in last year's Survey, the most common cause of delay was awaiting data or documentation approval from the traders or marketers. For more customized products like non-vanilla swaps and credit and equity derivatives, delays also tend to result from factors associated with processing new or non-standard products and from problems with non-standard language. And for credit derivatives in particular, delays might be the result of reference obligation data problems that come to light during the confirmation process.

Methods of confirming trades. The Survey requested the percentage volumes of trades confirmed by each of the following four methods:

1. We send a confirmation, which the counterparty signs and returns to us
2. The counterparty sends us a confirmation, which we sign and return
3. Both parties send out a confirmation, each of which is reviewed by the other and acknowledged but not signed or returned
4. Trades are matched by an auto-matching system

The results, shown in Chart 2.4, are generally similar to those from last year. Notably, auto-matching of vanilla swap confirmations is flat at 7 percent but auto-matching of credit derivatives confirmations has risen from zero to 4 percent.

Chart 2.4
Methods used by firms to confirm trades



Outstanding confirmations. Survey participants that send out confirmations (Method 1 in Chart 2.4) were asked to estimate the average number of confirmations that have been sent to the counterparty but not yet finalized or signed. The responses, shown in Table 2.3, are expressed as business days' worth of average confirmation volumes, where days are counted from the date of dispatch. The average number of outstanding confirmations in the 2004 Survey was lowest for FRAs and highest for credit derivatives.

Table 2.3

Confirmations outstanding

Business days' worth of average confirmation volumes sent but not yet finalized

	All respondents			Large firms			Medium firms			Small firms		
	2002	2003	2004	2002	2003	2004	2002	2003	2004	2002	2003	2004
FRAs	7.0	7.1	6.0	7.8	7.0	6.1	6.6	6.2	6.4	6.3	8.5	5.3
Vanilla swaps	9.1	8.9	8.9	10.7	9.6	10.8	9.1	7.4	10.4	7.4	9.6	4.8
Non-vanilla swaps	12.4	12.1	11.3	16.5	12.9	12.4	11.4	12.4	12.6	8.6	10.9	7.7
Interest rate options		10.7	9.3		11.0	11.1		11.6	9.7		9.4	6.6
Currency options		8.2	7.6		8.4	5.8		9.4	8.3		6.5	8.4
Credit derivatives	20.8	21.1	17.8	19.8	25.6	25.0	21.7	18.0	14.8	22.2	16.9	12.6
Equity derivatives	14.3	12.6	12.5	17.1	12.0	13.9	17.2	15.6	13.3	8.3	10.6	9.5
Commodity derivatives		9.5	12.1		9.6	13.5		5.1	11.4		19.5	3.0

Respondents also contributed information about their escalation procedures for outstanding confirmations. Around 90 percent of respondents have a formal escalation procedure. Escalation procedures tend to kick in after 30 days outstanding at large firms but sooner at small and medium firms.

Table 2.4 shows the responses to questions regarding the weighting of specific risk factors. The second column shows the percentage of respondents that monitor a particular criterion; the third shows the average ranking of importance of the category (with 1 being the lowest importance and 8 the highest). Days outstanding and net present value rank as important risk factors; among those respondents that chose "Other," additional risk factors included maturity date of trade, significant trade discrepancies, lack of trade acknowledgement, and confirmation workflow status (e.g., confirmation is with the legal department or with the client). Overall, there is a close correlation between ranking of importance of a risk factor and percent of firms monitoring the factor.

Table 2.4

Risk weightings used to prioritize outstandings

Risk category	Percent monitoring	Average ranking
Days outstanding	93	7.1
Other	100	6.0
Net present value	59	5.2
Master Agreement signed	59	4.4
Type of counterparty	70	4.7
Type of transaction	75	4.6
Credit rating of counterparty	46	4.1
Collateral held / Collateral agreement signed	28	3.3

Processing incoming confirmations. Firms that sign confirmations received from counterparties (Method 2 on page 10) were asked the average time it takes to process, from the time the confirmation is received to the time it is sent out again. Table 2.5 shows overall increases from last year, especially for credit derivatives and currency options.

Table 2.5
Average time to processing incoming confirmations
Business days, by product and firm size

	All respondents			Large firms			Medium firms			Small firms		
	2002	2003	2004	2002	2003	2004	2002	2003	2004	2002	2003	2004
FRAs	2.8	2.6	2.8	2.3	2.6	1.9	2.2	2.3	1.9	4.2	3.0	5.3
Vanilla swaps	4.1	2.6	3.2	3.3	2.9	2.8	2.9	2.4	2.1	5.9	2.7	5.6
Non-vanilla swaps	5.5	4.4	4.2	5.9	3.1	3.3	4.1	3.3	3.6	6.6	6.6	6.3
Interest rate options		3.1	3.8		2.8	2.2		2.5	3.0		4.1	7.2
Currency options		2.4	4.7		2.0	5.1		2.2	3.1		2.9	6.9
Credit derivatives	5.9	4.9	6.6	6.2	6.1	7.4	5.1	3.6	6.4	6.9	4.8	5.9
Equity derivatives	4.7	3.8	4.6	5.5	5.0	5.6	4.5	4.1	3.4	3.8	2.3	5.4
Commodity derivatives		2.5	3.4		2.2	3.9		2.6	3.1		3.0	NR

Trade discrepancies. Survey participants were asked about the length of time it normally takes to resolve trade discrepancies—that is, differences in how the parties to the trade recorded the details—when they come to light during the confirmation process, regardless of the source of the error. Their responses suggest that, in general, resolution times increase with complexity (Table 2.6).

Table 2.6
Time to resolve trade discrepancies and rebook trade
Business days

	All firms	Large firms	Medium firms	Small firms
FRAs	2.9	4.6	2.4	1.8
Vanilla swaps	3.3	3.8	3.0	3.1
Non-vanilla swaps	4.3	5.4	3.5	4.1
Interest rate options	3.7	4.9	3.0	3.6
Currency options	2.2	2.0	2.0	2.8
Credit derivatives	5.6	7.4	4.3	5.4
Equity derivatives	4.6	5.1	4.0	4.8
Commodity derivatives	2.5	1.9	3.5	2.0

The Survey asked respondents to rank in importance different causes of discrepancies. As in last year's Survey, firms rank nonresponsive counterparty and disagreement on trade details as the primary causes of discrepancies. For credit derivatives, non-standard language also ranks high as a cause of discrepancies.

Error rates attributable to confirmations area. Table 2.7 shows the estimated error rates arising from the confirmations area, expressed as percent of volume. Overall, error rates are similar to those in last year's Survey.

Table 2.7
Average estimated error rates attributable to the confirmations area
Percents, by firm size

	All respondents			Large firms			Medium firms			Small firms		
	2002	2003	2004	2002	2003	2004	2002	2003	2004	2002	2003	2004
FRA's	3	3	4	3	2	2	2	4	2	4	3	12
Vanilla swaps	6	5	6	4	4	4	3	5	5	12	6	11
Non-vanilla swaps	5	8	7	4	5	7	4	9	5	6	11	8
Interest rate options		4	5		4	4		4	3		5	8
Currency options		5	3		2	3		4	3		10	7
Credit derivatives	2	5	5	5	6	5	2	5	4	0	4	6
Equity derivatives	4	5	6	4	5	5	4	6	5	3	5	10
Commodity derivatives		3	3		2	3		4	3		1	5

Payments and settlements

Table 2.8 shows average monthly settlements for five products. With the exception of equity derivatives, settlements are up by more than 20 percent from last year.

Table 2.8
Average monthly settlements

	All firms		Large firms		Medium firms		Small firms	
	2003	2004	2003	2004	2003	2004	2003	2004
Interest rate derivatives	8,014	9,934	20,959	25,591	3,762	5,593	1,287	1,409
Currency options	1,858	2,457	5,367	6,915	540	641	235	107
Equity derivatives	1,444	819	3,630	2,223	288	213	147	107
Credit derivatives	1,503	2,042	3,463	5,457	296	190	189	139
Commodity derivatives	1,034	1,165	1,820	2,016	133	379	68	50

Settlement errors. Table 2.9 on the following page shows that incidence of errors is evenly balanced between payments received and payments made for interest rate derivatives and currency options; for equity, credit, and commodity derivatives, in contrast, incidence of errors is higher in payments made.

Payment advices. Previous Operations Surveys predicted a decline in the practice of sending payment advices. Last year's Survey appeared to show a reversal of the trend, but the 2004 Survey presents mixed results. The only product for which Table 2.9 shows a clear decrease in the sending of payment advices is equity derivatives; there is a smaller decrease for equity derivatives.

Nostro breaks. Survey participants were asked how many new nostro breaks — that is, discrepancies between expected and actual cash settlements — they normally have per day, expressed as a percentage of average daily settlement. Commodity derivatives report the highest incidence of nostro breaks, followed by equity and credit derivatives .

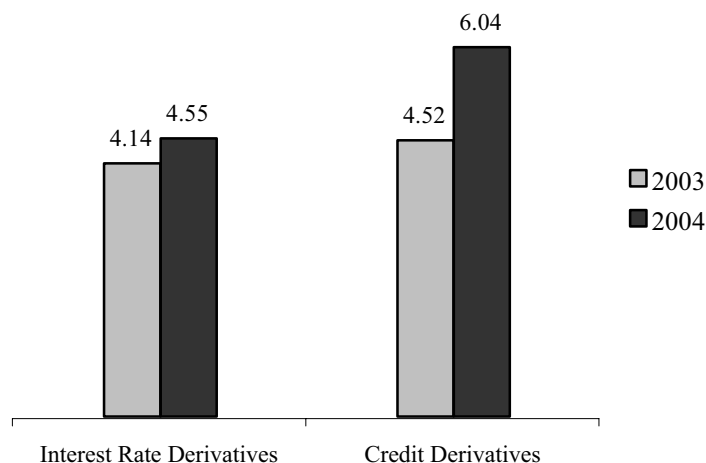
Most firms report that there is an amount that their firm is generally prepared to waive before making an interest claim on a nostro break. Table 2.9 shows the average amount waived by product.

Table 2.9
Settlement error rates, nostro breaks, and payment advices

	Interest rate derivatives		Currency options		Equity derivatives		Credit derivatives		Commodity derivatives	
	2003	2004	2003	2004	2003	2004	2003	2004	2003	2004
Average error rate on payments made (percent of monthly volumes)	1	2	1	2	3	4	4	3	1	1
Average error rate on payments received (percent of monthly volumes)	3	3	2	2	5	6	6	5	4	3
Average number of new nostro breaks per day (percent of daily settlements)	5	4	6	3	7	6	8	6	11	8
Percent of payments made for which payment advices sent	82	78	74	83	81	60	81	80	92	93
Percent of payments received for which payment advices sent	83	74	70	78	81	59	77	72	91	87
Respondents waive some nostro break amount		91		84		87		93		78
Average nostro amount waived (USD)		271		401		289		286		305

Payment break resolution. Finally, the Survey asked respondents for the distribution of times to payment break resolution; Chart 2.5 shows the change in weighted average time to settlement for interest rate derivatives and credit derivatives. Both products have seen increases in time to settlement compared with last year, but the increase is far more pronounced for credit derivatives.

Charts 2.5
Average time frame for payment break resolution, 2003-2004 Surveys
Interest rate and credit derivatives



PART 3 - AUTOMATION

Straight Through Processing (STP), a long-term focus of the ISDA Operations Committee, requires a high degree of standardization and automation. Standardization initiatives, which take place at the industry level and are sponsored by the ISDA Operations Committee, include the settlement matrix, efforts toward a uniform novation agreement, and the Master Confirmations. Another standardization initiative is [Financial Products Markup Language \(FpML\)](#). Automation, in contrast, occurs at the firm level, and is the focus of Part 3. The following results cover the extent of automation and plans for further automation during calendar year 2003. In addition, we report on implementation of FpML at responding firms. All comparisons in the automation section are restricted to firms that responded in both 2003 and 2004.

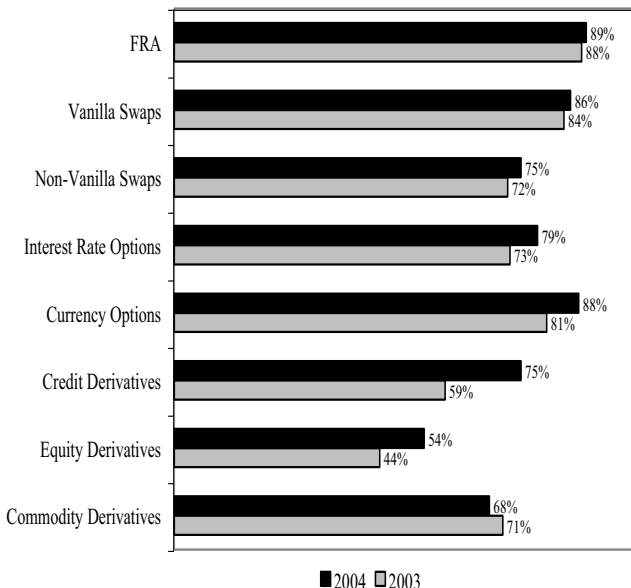
Current extent of automation. The Survey focuses on several key functions in the processing chain by asking respondents for the percent of OTC derivatives volume that each function handles with no (or minimal) manual intervention. The questions cover the complete range of products covered in the Survey. Charts 3.1a–i show how respondents answered these questions; for each function, the chart shows the weighted average percent of volume automated.

Overall, there were improvements across the board in all functions and in all products. The most significant increase in automation in the 2004 Survey was for credit derivatives, possibly because two automation initiatives, namely, DTCC and SwapsWire, came on line in the fourth quarter of 2003.

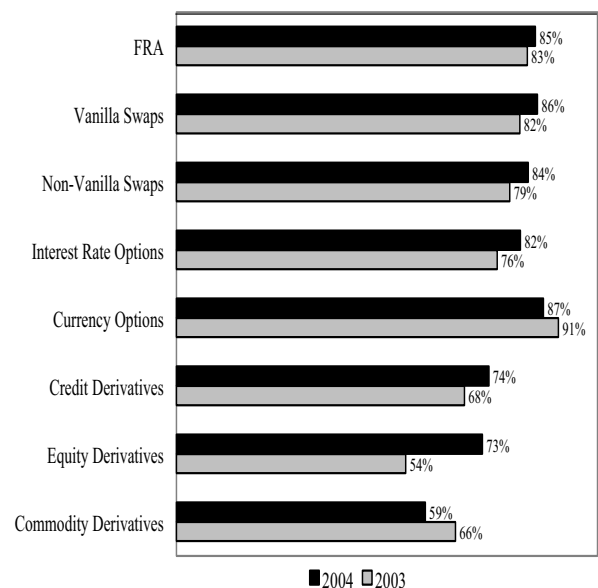
Looking at automation across products, currency options and forward rate agreements are the most automated, followed closely by vanilla swaps. Credit, equity, and commodity derivatives still tend to be less automated, although the gap between products is narrowing. As mentioned above, the increase in automation was most significant for credit derivatives, although this growth occurred from a low base relative to other products.

Charts 3.1 Extent of automation of operations functions, 2003-04

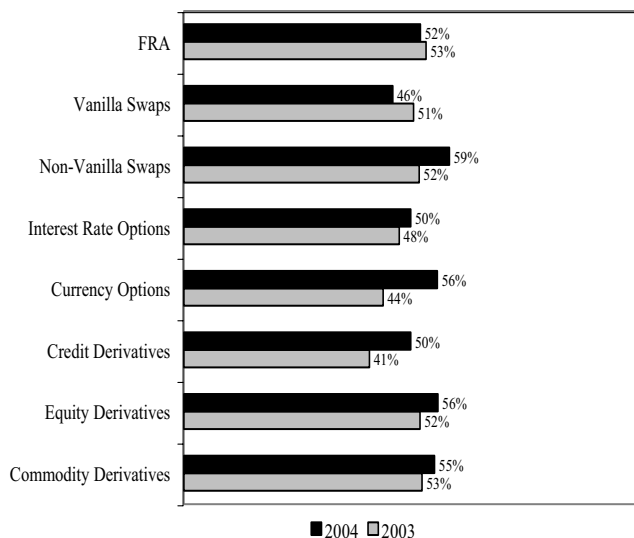
3.1a Trade data transferred from front office to operations system for processing



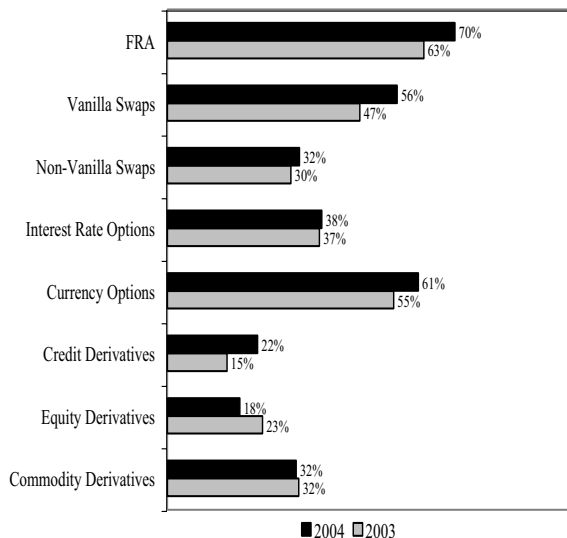
3.1b Trade data transferred from operations system to general ledger



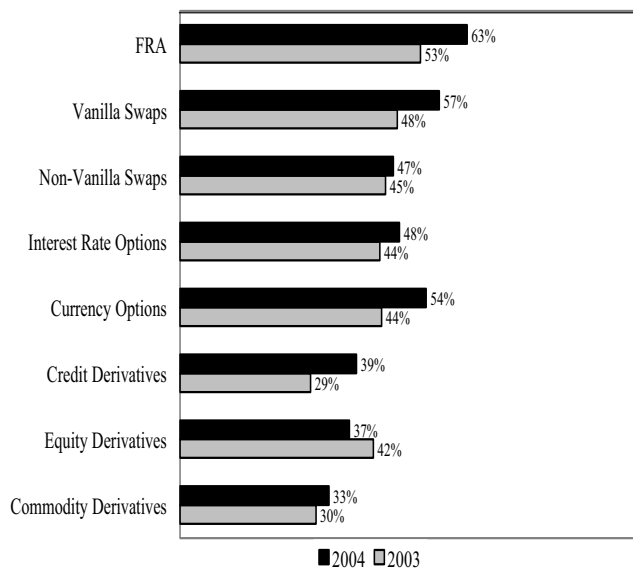
3.1c Additional data added to front office trade record in order to process



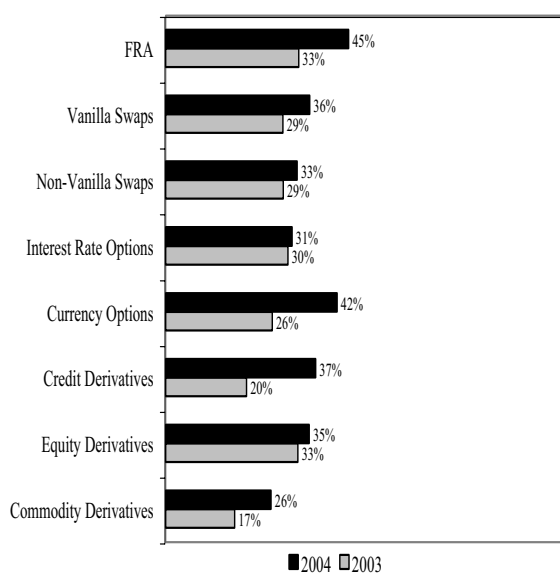
3.1d Confirmation sent



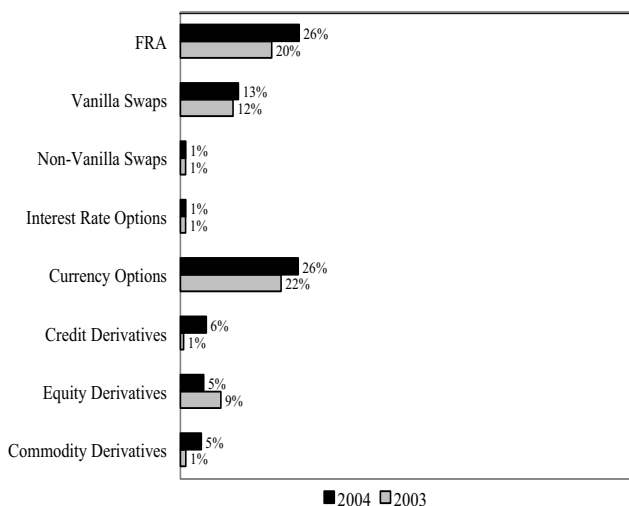
3.1e Imaging of outgoing confirmation



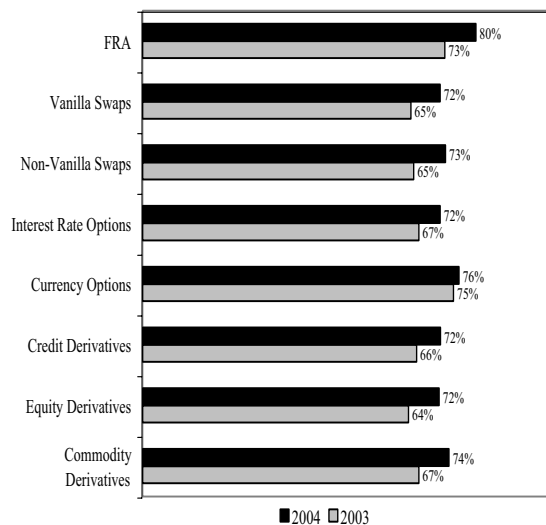
3.1f Imaging of incoming confirmation



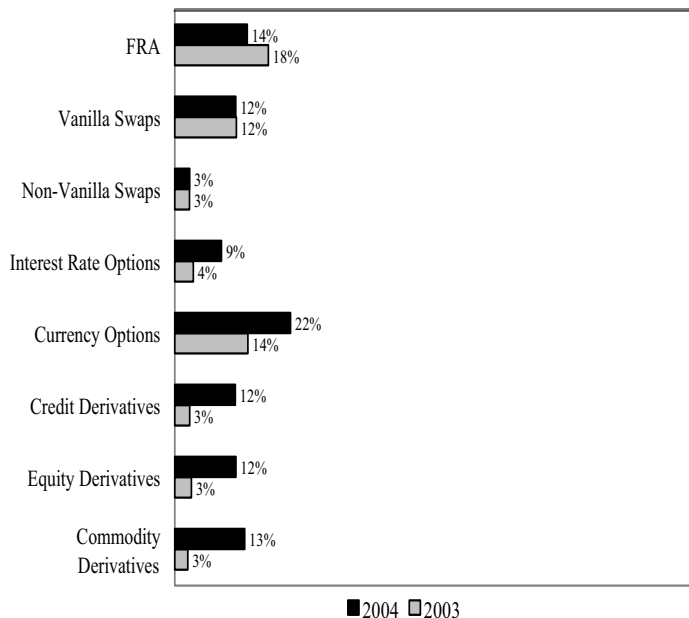
3.1g Matching of confirmation details



3.1h Nostro reconciliation



3.1i Automated settlement matching (through a clearing house)



Looking across functions, respondents report the highest degree of automation for transfer of trade data from front office to operations (Chart 3.1a), for transfer of trade data from operations system to general ledger (Chart 3.1b), and for nostro reconciliation (Chart 3.1h). The least automated functions remain imaging of incoming confirmations (Chart 3.1f) and matching of details on confirmations (Chart 3.1g). There was significant growth since 2003 in the automation of these functions, however, especially for credit derivatives. Automated settlement matching through a clearing house also increased significantly (from a low base) since the last Survey, especially for credit, equity, and commodity derivatives (Chart 3.1i).

The Survey also asked respondents about their plans for further automation of various functions; past surveys suggested that respondents planned significant future increases in automation. Table 3.1 takes a new approach to this question by comparing respondent plans for future automation in the 2003 Survey (Table 3.1, column 2) with actual increase in percent of automation from 2003 to 2004 (column 3). The table also shows the percent of respondents to the 2004 Survey that plan increases in automation. All percentages are averages across products. Table 3.1 illustrates the gap between intention to automate and the ability to make further automation a reality. In 2003, for example, fully half the respondents stated that they plan to increase automation, especially for relatively manual functions such as sending of confirmations; respondents to the 2004 Survey expressed similar intentions. But change does not occur overnight: actual changes in automation in a given year tend to be modest, as shown by the average change in reported automation of about 2.5 percent since last year's Survey.

Table 3.1
Planned automation versus realized automation
Percents

	Planned to increase, 2003 Survey	Actual average change, 2003-2004	Plan to increase, 2004 Survey
Trade data transfer from front office to operations	58	4.3	53
Trade data transfer from operations system to GL	44	3.2	41
Additional data added to front office trade record	48	3.3	41
Confirmation sent	74	2.1	66
Imaging of outgoing confirmation	52	2.9	46
Imaging of incoming confirmation	64	7	55
Matching of details on confirmation	47	2	42
NOSTRO reconciliation	37	5.9	37

Financial products Markup Language. FpML is the industry standard protocol for complex financial products. ISDA took on the development of FpML as a major initiative in the beginning of 2002, with the goal of creating the same level of standardization for electronic execution and documentation of trades as it provides through its legal documentation. Table 3.2 shows the responses to Survey questions regarding current and planned use of FpML. Widespread adoption of FpML promises to be of particular value to firms in automating the matching of confirmation details, which so far has shown a low degree of automation (Chart 3g).

Table 3.2
Financial products Markup Language (FpML)
Percents

	All firms			Large firms			Medium firms			Small firms		
	2002	2003	2004	2002	2003	2004	2002	2003	2004	2002	2003	2004
Firms using FpML:												
Internally	6	7	17	11	21	35	5	0	0	0	0	0
Externally	2	7	0	6	21	0	0	0	0	0	0	0
Both	14	10	14	28	21	30	5	11	5	7	0	0
Neither	79	76	69	56	37	35	89	89	95	93	100	100
Plan to increase use of FpML over 12 months	34	43	45	76	80	80	6	30	38	20	8	8

PART 4 – STAFFING AND ORGANIZATION

Staffing and productivity. Table 4.1 contains staffing ratios, where staff numbers are full-time equivalent and exclude staff required to process internal deals; Charts 4.1 and 4.2 show staffing ratios by size class. Table 4.1 also shows average salaries, which consist of basic salary and bonus with overhead excluded. As is true in the rest of this Survey, all 2004 Survey staffing and salary results are based on calendar year 2003 data. The increase in salary levels is likely due in large part to the weakening of the U.S. dollar against some reporting currencies such as the euro.

Table 4.1
Staffing numbers

Percents unless otherwise indicated

	Front office/ processing staff		Front office/ trade capture staff		Weekly deals/ processing staff			Average salary plus bonus (USD)		
	2003	2004	2003	2004	2002	2003	2004	2002	2003	2004
All IR derivatives	1.0	1.0	3.2	3.1	14.7	15.7	16.5	57,000	57,000	62,000
Currency options	1.7	1.9	2.6	3.6	45.2	70.8	93.5	50,000	53,000	59,000
Equity derivatives	1.9	2.1	3.4	5.0	9.2	22.8	24.3	64,000	65,000	70,000
Credit derivatives	1.3	1.5	2.2	2.1	5.5	8.2	9.7	65,000	62,000	67,000
Commodity der.	1.8	2.3	5.6	3.3	23.1	32.1	48.4	52,000	53,000	61,000

Both staffing ratios—front office traders to trade processing staff and average weekly deals to trade processing staff—are measures of back office productivity. Comparing the ratios across products, the two are consistent in that they show higher productivity for currency options, commodity derivatives, and equity derivatives than for interest rate derivatives and credit derivatives. At least in the case of currency options, it is likely that the higher productivity is related to the higher degree of automation. It is not clear, however, why the ratios for equity and commodity derivatives—which tend to be less automated than other products (Part 3)—are as high as they are relative to other products. Comparing the results from 2003 and 2004, Table 4.1 shows that relative productivity rankings between products has remained steady.

Chart 4.1
Average number of front-office trader per trade processing staff member, by firm size
Percents

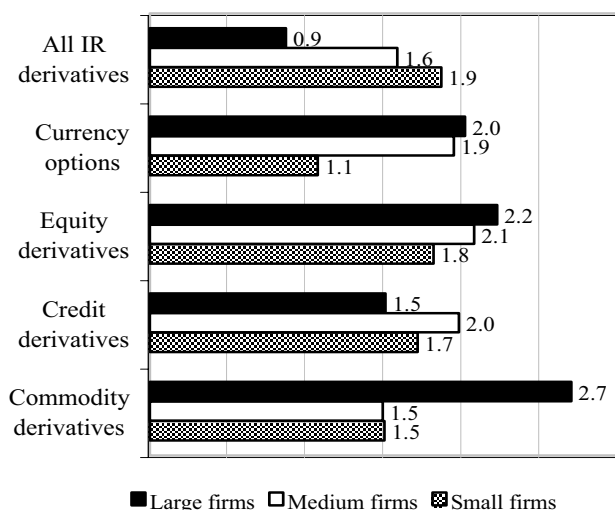
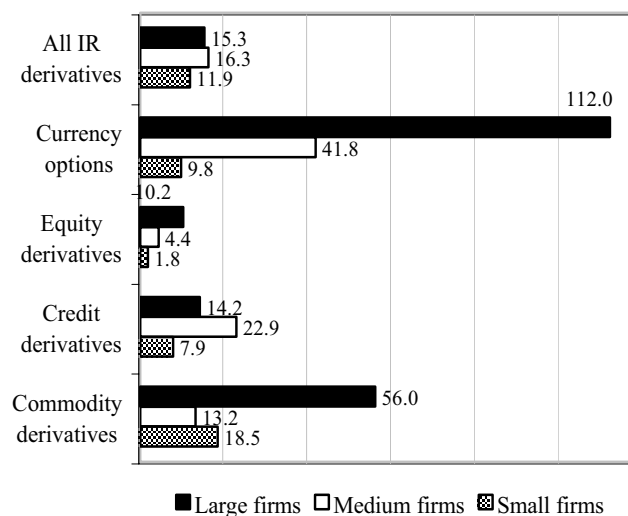


Chart 4.2
Average number of weekly deals per trade processing staff member, by firm size
Percents



Staff turnover. As in preceding years, most respondents reported staff turnover between 10 and 30 percent; the average staff turnover figure of 20 percent is higher than last year's 17 percent (Chart 4.3). Not all turnover results in operations staff leaving the organization, and the Survey asked respondents for data on the percentage that move internally into other roles. As was the case last year, the responses indicate that around half stay within their firms and that half move to other firms(Chart 4.4). But for large firms in this year's Survey, about two thirds move internally, which is a significant change from last year when only one third stayed within the firm. Also consistent with last year's Survey, about half of staff who leave the organization altogether go to competitor firms.

Chart 4.3
Average annual turnover
Percents

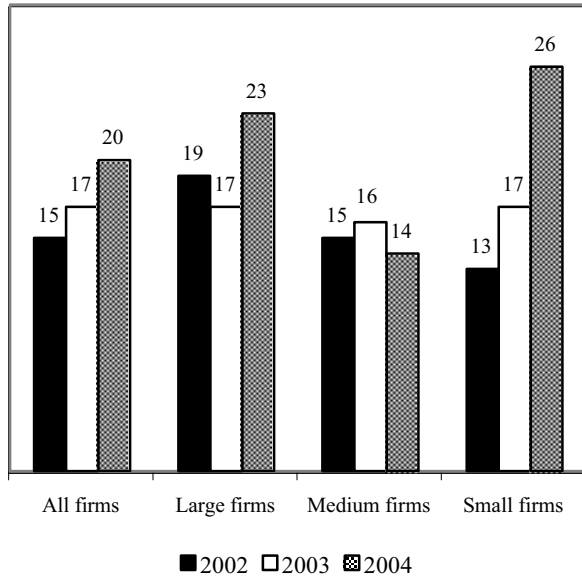
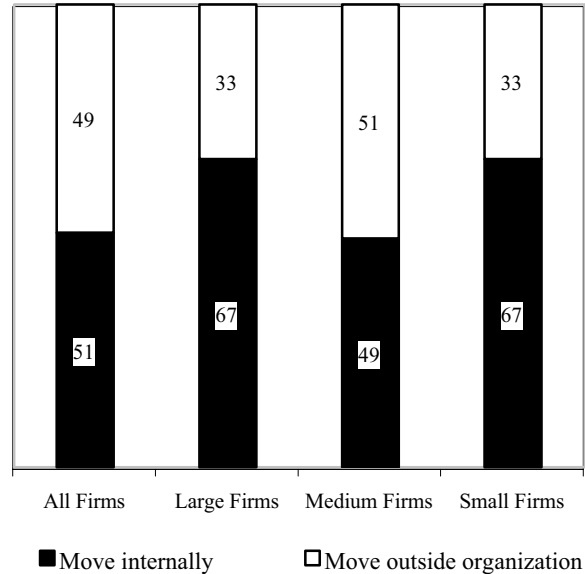


Chart 4.4
Sources of turnover
Percents



Training. The percentage of respondents with formal training programs has remained stable since last year's Survey for all respondents, but the aggregate results conceal differences among firms of different size (Table 4.2). The most common number of days devoted to training at large and medium firms is between three and six days, while the most common number for small firms is three or fewer days. The average cost of training an operations professional averaged \$1,760—compared with \$1,500 in 2003—and was similar across all three size classes.

Table 4.2
Training for operations professionals
Percents

	Large firms		Medium firms		Small firms	
	2003	2004	2003	2004	2003	2004
Training program in place	65	65	63	72	38	45
Training days per year						
0-3 days	30	18	30	36	70	60
3-6 days	60	76	50	52	25	30
6-10 days	10	6	10	0	5	10
> 10 days	0	0	10	12	0	0

Organizational structure. The Survey attempts to determine the extent to which firms favor centralized or local processing. Centralized processing potentially offer efficiencies through improved control and reduced duplication of facilities, while decentralized processing can reduce response time and facilitate communication with front offices and customers. Further, the Survey asks respondents whether they prefer organizing by function, by product, or by a combination of the two. Table 4.3 shows the results, along with additional tasks performed by the operations function.

Table 4.3
Organization of operations function
Percents

	All firms	Large firms	Medium firms	Small firms
Operations function is centrally managed	73	47	84	81
<i>Operations function is organized by:</i>				
Function	19	12	16	30
Product	18	12	24	15
Combination	63	76	60	55
<i>Additional tasks performed by Operations function:</i>				
Trade capture/enrichment	71	72	68	74
Draft documentation	42	44	44	39
Brokerage analysis and reconciliation	70	72	72	65
Collateral/margin management	71	67	64	83
Mark-to-market	62	44	80	57
Client valuations	56	72	56	43

Disaster recovery and business continuity. Following the September 11 terrorist attacks and the resulting market disruptions, the 2002 Survey added questions regarding disaster recovery capabilities and business continuity planning. Table 4.4 summarizes the results for the 2004 Survey.

Table 4.4
Disaster recovery and business continuity
Percents

	All firms	Large firms	Medium firms	Small firms
Organizations with documented plans	98	100	100	96
<i>Expected recovery period:</i>				
Less than 4 hours	58	76	67	35
4 - 8 hours	11	6	8	17
Within one day	19	12	17	26
1 - 2 days	8	0	8	13
More than 2 days	5	6	0	9
Other	0	0	0	0
<i>Recovery facility characteristics:</i>				
Off-site recovery location for IT and operations staff	95	100	100	87
Data center separate from operations location	80	88	92	61
Recovery site on separate power grid from data center	94	100	100	83

PART 5 – MARKET PRACTICE

The last part of the Operations Benchmarking Survey refers to current trends in market practice.

One set of questions on market practice concern procedures for signing confirmations produced by OTC derivative counterparties. As a general matter, the flexibility of the approach to confirmations signed increases with firm size. Table 5.1 shows the results in more detail.

Table 5.1
Signing counterparty confirmations

	2003	2004	2004 Survey		
			Large	Medium	Small
Signing counterparty confirmations					
My firm never signs counterparty confirms as a matter of policy	7	7	7	0	3
My firm will sign confirmations for certain counterparties only	16	12	20	12	6
My firm will sign confirmations only for certain products	3	3	0	4	14
My firm will sign confirmations only for certain counterparties and certain products	26	22	40	20	20
Flexible approach – each trade/set of trades considered on its own merits	30	39	33	52	46
My firm always signs counterparty confirmations	18	17	0	12	11

The Survey also asked participants about the use of termination agreements for a full unwind of a trade. The results, shown in Table 5.2, are consistent with those of previous years. That is, the majority send out a termination agreement, which is signed by the counterparty and returned.

Table 5.2
Termination agreements

	2003	2004	2004 Survey		
			Large	Medium	Small
<i>Communicating with a counterparty about a termination (full unwind, except credit swaps)</i>					
You send out a termination agreement, which is signed by the counterparty and returned	44	43	40	51	52
You send out a termination agreement, which you match with an agreement you receive from the counterparty	19	20	17	39	57
You send out a termination agreement, to which your counterparty does not respond	14	14	35	21	17
You sign and return a termination agreement from your counterparty	23	23	9	33	48
<i>Credit derivatives</i>					
Signed termination required for credit derivatives	82	92	82	48	52
<i>Partial unwinds</i>					
Send out an amended confirmation	40	39	25	72	39
Prepare a partial termination document	60	61	75	28	61

Finally, Table 5.3 summarizes responses to the other market practice questions. Notable results include the following.

- The practice of requiring a signed termination for credit derivatives is more widespread than in the prior year.
- The number of transactions confirmed by telephone continues to fall, although the decrease from last year was not large.
- The move towards the elimination of rate reset notices - as recommended by the ISDA Operations Committee - continues for vanilla swaps. An increasing number of firms also plan to eliminate reset notices for commodity and equity derivatives.

Table 5.3
Other market practice issues

	All firms	Large firms	Medium firms	Small firms
Swaption straddles				
<i>For European swaption straddles, firm sends out:</i>				
Single confirmation	51	59	55	7
Two separate confirmations	49	41	45	93
Phone confirmations				
<i>Respondents report they phone confirm the following:</i>				
Notional principal exchanges (initial and final)	67	78	40	43
Coupons - Accrual settlements for vanilla	38	33	40	57
Coupons - Accrual settlements for non-vanilla	44	50	60	43
Premiums (Caps, floors, swaptions, and bond options)	62	72	56	58
Fees (Up-front, 3d party, and cancellations)	56	72	42	25
Measures of capital allocated to operational risk				
Metric in place	56	59	60	40
Plan to develop in next year	48	57	50	75
ISDA Settlement Matrix				
Implemented as default	52	81	55	25
Plan to implement	10	67	0	76

APPENDIX 1 – 2004 SURVEY PARTICIPANTS

ISDA thanks the following institutions for responding to the 2004 Operations Benchmarking Survey.

Abbey National Financial Products	JP Morgan Chase
ABN Amro	KBC Bank
ABSA Corporate and Merchant Bank	KeyBank
AmMerchant Bank Berhad	Landesbank Baden-Württemberg
Australia and New Zealand Banking Group	Lloyds TSB
Banca Nazionale del Lavoro	Mellon Bank
Banco Bilbao Vizcaya Argentaria (BBVA)	Merrill Lynch
Bank of America	Mitsubishi Trust and Banking Corporation
Bank of Montreal	Mizuho Capital Markets Corp.
Bank Of New York	Mizuho Corporate Bank
Bank of Tokyo-Mitsubishi	Morgan Stanley
Bank One	National Australia Bank
Barclays Bank	National Bank of Canada
BNP Paribas	Nikko Citigroup
British Petroleum Company	Nikko Cordial Securities
CDC IXIS Capital Markets	Nomura Securities
Citibank	Nordea Bank Finland
Commerzbank	Pacific Life Insurance Company
Commonwealth Bank of Australia	Rabobank International
Credit Suisse First Boston	Royal Bank of Canada
Daiwa Securities SMBC	Royal Bank of Scotland Financial Markets
Danske Bank	RWE Trading Gmbh
Den Norske Bank	Santander Central Hispano
Deutsche Bank	Societe Generale
Dexia Bank Belgium	St George Bank
Dresdner Kleinwort Wasserstein	Standard Bank of South Africa
DZ Bank	Standard Chartered Bank
Freddie Mac	SunTrust Bank
Goldman Sachs	Svenska Handelsbanken
Greenwich Capital Markets	UBS Investment Bank
HBOS Treasury Services	UFJ International
HSBC Bank (USA)	Wachovia Corp.
ING Belgium	Zürcher Kantonalbank
ING BHF-Bank	

APPENDIX 2 – DEFINITIONS USED IN 2004 SURVEY

The following product definitions were specified in the Instructions to the ISDA 2004 Operations Benchmarking Survey.

All interest rate derivatives and cross-currency swaps include such contracts as FRAs; vanilla and non-vanilla interest rate and cross-currency swaps, as defined below; swap options (swaptions); binary and average rate options; and exotic options.

Vanilla interest rate and currency swaps are interest rate or cross-currency swaps capable of being electronically matched by a commercially available auto-matching engine such as Swift Accord.

Non-vanilla interest rate and cross-currency swaps includes all other interest rate and currency swaps, including exotic structured swaps such as mutual puts and amortizing swaps. Non-vanilla swaps also include swaps with embedded options. The Survey makes the distinction between vanilla and non-vanilla swaps because the complex, customized nature of non-vanilla swaps causes particular processing issues that we want to capture. The expansion of auto-matching capabilities in commercial systems to include increasingly complex products means that swaps classified as non-vanilla in one year's Survey might be classified as vanilla in the next year's Survey.

Interest rate options include interest rate caps, floors, and collars, swap options (swaptions), binary and average rate options, exotic options

Currency/FX options include cross currency/FX puts, calls, range forwards, and corridors; binary and average rate options, barrier and rainbow options, and quantos

Credit derivatives, whether referenced to single names, baskets, or portfolios, include credit default swaps, total return swaps, credit-linked notes, and credit spread options and forwards

Equity derivatives are contracts with payments linked to the performance of equities, baskets of equities, or equity indices. For this Survey, equity derivatives include equity forwards, equity swaps, equity options (but not warrants or exchange-traded equity options), equity-linked notes, and relative performance trades

Commodity derivatives are swaps, forwards, or options on commodity prices or indices. Common underlying commodities include precious and base metals, crude oil and other petroleum products, natural gas, electric power, and weather

Traders includes only traders and not marketers or other front office staff; *trade capture staff* includes employees whose function is to enter trade data into operations systems; and *trade processing staff* includes employees involved in trade confirmation, settlement, reset, and reconciliation.

Days means business days in this Survey, and *close-of-business* (COB) refers to the customary end of the business day in the trading location.

An *active counterparty* is one with which a respondent institution had at least one trade during calendar year 2003.

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