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GFMA GLOBAL FX DIVISION

OTC FX OPTIONS CLEARING & SETTLEMENT ANALYSIS RESULTS
NOVEMBER 18, 2013

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I. Executive Summary

Executive Summary

- **Completion of Quantitative Study Covering Five Years of Detailed Trade Information for OTC FX Options Market.** The GFMA Global FX Division, with its 22 global FX member firms representing over 90% of the FX dealer flow, has completed a year-long study to understand the scale of transactions in the physically-settled OTC FX options market to size the same day liquidity challenge associated with clearing this market.
- **Same Day Liquidity Challenge for OTC FX Options Market – Full and Timely Settlement of Currencies.** In contrast to other markets, the FX market – as a global payments system – is fundamentally about liquidity, i.e., ensuring funds in the correct (needed) currency are received when they are expected to be received by transacting parties. CCPs must understand the size and nature of the same day liquidity risk in order to guarantee full and timely settlement of the currencies traded for this product, and ensure this guarantee is credible, in satisfaction of global regulatory expectations reflected in the *Principles for financial market infrastructures* jointly published by the BIS CPSS and IOSCO in April 2012 (FMI Principles).
- **Key Question – Size of the Same Day Liquidity Challenge – Asked and Answered by Quantitative Study**
 - Results from the analysis indicate that, based on historical OTC FX options traded and exercised, CCPs clearing these transactions would have needed to demonstrate an ability to maintain minimum capabilities of converting funds, same day, into currencies non-failing clearing firms were expecting to receive – in an amount equal to (in USD equivalent, in total across 17 currencies) – if settlement obligations were conducted
 - on a **net** basis: **37 billion** for interdealer market
44 billion if extended to clients
 - on a **gross** basis: **106 billion** for interdealer market
161 billion if extended to clients
 - The differential between the net and gross figures provide an indication of the extent to which the mechanism used for settlement could directly impact the size of the same day liquidity risk shortfall the largest two failing clearing firms may present to, and must be managed by, CCPs under the FMI Principles “cover 2” liquidity requirement. Because the size of the settlement obligation is a function of the settlement mechanism used, the way in which the settlement mechanism is structured and designed can affect and, in some cases, limit the size of this liquidity risk shortfall.
 - Currency specific peak figures (individual and total) and overall peak figures are *both* relevant to the design of a clearing and settlement solution. While a CCP must be prepared for these potential same-day liquidity needs in *each* currency, a CCP would not draw fully (i.e., 100%) on its capabilities in each currency if a settlement failure were to occur.
 - While results provides an indication of minimum, baseline same day liquidity requirements, they do *not* address stress scenarios, such as changes in market behavior (which could have led to an increase/decrease in values/volumes of FX options traded) or FX market movements (which could have led to more/less exercised options). Analyses conducted also provide an indication of how the identity and number of providers of client clearing services and number of CCPs may impact settlement obligations and payment reduction benefits.

Settlement Obligations – Single Day (in billions, USD equivalent)				
	Interdealer Market		Interdealer Market with Client Clearing	
	Net	Gross	Net	Gross
Overall Peaks				
	9	52	11	81
Currency Specific Peaks				
AUD	1.93	2.71	1.94	6.89
CAD	1.23	8.46	1.38	9.62
CHF	2.82	21.11	3.69	21.15
DKK	0.07	0.07	0.27	0.27
EUR	8.51	24.28	10.44	29.71
GBP	3.06	4.72	3.04	7.35
HKD	1.70	3.29	1.70	3.46
ILS	0.79	1.76	1.33	6.83
JPY	2.80	9.91	3.41	18.89
KRW	1.62	2.23	1.62	2.81
MXN	1.27	2.58	1.45	5.03
NOK	0.66	2.10	0.99	4.00
NZD	1.06	2.16	1.17	2.85
SEK	1.58	2.48	1.15	4.11
SGD	0.54	1.16	0.99	3.17
USD	5.94	16.04	8.20	33.02
ZAR	0.93	1.15	0.93	1.56
TOTAL	36.51	106.21	43.70	160.72

II. Background

FX Industry Response to OTC FX Options Clearing Challenge

Regulatory Landscape

- G-20 commitments include a requirement to clear all standardized OTC derivatives through CCPs where appropriate.
- Each country or region continues to assess the mechanism by which asset classes are captured by this commitment and determine which products within such asset classes will be subject to a “mandatory” clearing requirement.

Regulatory Expectations

- The primary OTC FX options clearing challenge is to ensure that all participants accurately identify, understand and manage their credit and liquidity risks individually and to a CCP, and that the CCP can also identify, understand and manage its credit and liquidity risks.
- April 2012 BIS Committee on Payment and Settlement Systems (CPSS) and International Organization of Securities Commissions (IOSCO) *Principles for Financial Market Infrastructures* (FMI Principles) are widely understood to require a “**guaranteed, on-time clearing and settlement model.**” Specifically, that a CCP for **physically settled** OTC FX trades, including FX options, must:
 - Guarantee the **full and timely settlement** of the currencies of the trade; and
 - Ensure the **guarantee is credible** and addresses extreme but plausible market conditions as identified by rigorous stress testing.
- Separately, central banks have also expressed their need, from a broad policy perspective, to receive more information about FX-related clearing proposals of each individual CCP in order to understand and review potential implications for their currencies and for the FX market.
- Due to insufficient understanding in the industry of the size and nature of the risks for which a solution is being sought, no OTC FX options clearing model put forward by CCPs and considered by industry has demonstrated the ability to implement safe and sound measures that (i) address the OTC FX options clearing challenge; and (ii) ensure the market can appropriately manage its liquidity and credit risks.

Quantitative Study

- The GFMA Global FX Division collected and analyzed transactional data covering five years (Jan 2007 – Dec 2011) from its members, 22 global dealers representing over 90% of FX dealer flow. Analytical support was provided by Deloitte Consulting to GFMA. In addition, key and interested stakeholders, e.g., central banks and other regulatory authorities, CCPs and CLS, have been consulted during the course of this project.
- *Sizing the liquidity shortfall* – What is the size of the same day liquidity shortfall which could have resulted from the failure of the two clearing firms representing the largest combined settlement obligations in each currency on any given settlement date with respect to executed OTC FX options that were exercised and due for settlement on such date (aka, **the same day liquidity shortfall for deliverable OTC FX options**) which a CCP must be capable of managing? This is the **FMI Principles “cover 2” liquidity requirement.**
- *Relevance of this figure* – A CCP must (i) have, or have access to, sufficient funds to cover that liquidity shortfall and (ii) be capable of converting such funds, same day, into the currencies which its other (non-failing) clearing firms were expecting to receive on that date.

Key Phases to Solving an Industry Problem

Completed by GFMA Global FX Division

Phase 1

Project set up

Phase 2

Project oversight & governance

Phase 3

Scope investigation & data collection

Phase 4

Data collection, analysis & conclusions

A quantitative study has been conducted to understand the scale of transactions in the deliverable OTC FX options market and associated settlement obligations due on any settlement date in order to size the same day liquidity challenge for this market. The question asked and answered by this study:

“What is the size of the same day liquidity shortfall which could have resulted from the failure of the two clearing firms representing the largest combined settlement obligation in each currency on any given settlement date with respect to executed OTC FX options that were exercised and due for settlement on that date?”

The answer to this question informs a CCP desiring to clear these deliverable products of the capabilities *and* resources required to address same day liquidity shortfalls in satisfaction of the FMI Principles “cover 2” liquidity requirement. **Deliverable OTC FX** is traded and settled on the basis of physical settlement, i.e., the exchange of principal in two currencies on the settlement date. As such, the expectation is for a CCP to credibly demonstrate transacting parties will be made “whole” by guaranteeing they will receive what they were expecting to receive on the settlement date, i.e., the currencies they purchased (in exchange for currencies they sold). In contrast, most OTC derivatives are traded and settled on the basis of net cash settlement in a single currency that reflects the mark-to-market value of the trade; CCPs for these products ensure transacting parties are made “whole” by guaranteeing they will receive what they were expecting to receive during the life of the instrument and on settlement date, i.e., the mark-to-market each day, including on the settlement date.

Next Phases for FX Industry

Phase 5

Investigation of potential CCP solutions. Explore and assess robustness and resilience of potential clearing and settlement models. For example, some possibilities include, but are not limited to (i) an integrate CCP and settlement solution that processes settlement obligations on a gross basis; (ii) an integrated CCP and settlement solution that processes settlement obligations on a net basis; (iii) a CCP that submits settlement instructions to a settlement system (like CLS) that processes settlement obligations on a gross basis; or (iv) a CCP that submits settlement instructions to a settlement system that processes settlement obligations on a net basis.
(Note – focus is on a single CCP for simplicity and to achieve greatest netting efficiencies; but this is not intended to suggest or promote a single CCP.)

Phase 6

Impact analysis (e.g., settlement platforms etc.). If solution contemplates use of CLS, CLS would then be requested to consider impact of solution on its settlement service and feasibility of implementation, subject to receipt of all necessary regulatory approvals.

Phase 7

Implementation outline

Phase 8

Implementation (development & testing; regulatory approval)

Approach for Sizing Same Day Liquidity Shortfall For OTC FX Options

Trade Population for Data Collection

- Data collected from Global FX Division member firms (22) who represent 90% of FX dealer flow. The data includes trades with other Global FX Division (GFXD) firms (inter-dealer market), and non-GFXD firms (i.e., clients as well as other dealers).
- Expiry date on or between January 2007 – December 2011.
- Transaction data for OTC FX vanilla options, European style, executed on basis of physical settlement.
- Note: summary data for other OTC FX options (American style, executed on basis of physical settled; cash settled; and exotics) was collected for the purpose of providing an indication of the relative product composition of the OTC FX options market.

Main Assumptions Used For Data Analysis of OTC FX Vanilla Options, European Style

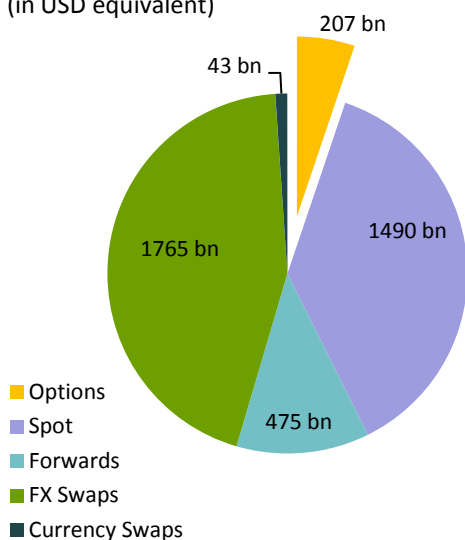
- An option determined to be *in-the-money* (based on prevailing market rates) on its “exercise date” was settled on the “settlement date” specified in the trade data.
- A single CCP (in order to achieve greatest netting efficiencies, but not intended to suggest or promote a single CCP).
 - *Note: Liquidity figures were also calculated on the basis of multiple (3 and 5) CCPs for illustrative purposes only, namely to provide an indication of how the size of the same day liquidity challenge may vary based on the number of CCPs.*
- Each GFXD firm is a clearing firm.
- The CCP calculates settlement obligations due to it from its clearing firms on the basis of multilateral netting under an integrated solution for clearing and settlement.
- For client clearing scenarios (3), assumptions regarding concentration in firms providing this client service have been made: client clearing through (i) a single existing GFXD firm (e.g., a dominant FX PB firm); (ii) five existing GFXD firms (e.g., major FX PB firms); or (iii) a single non-GFXD firm.

General Calculation – for each settlement date, with respect to OTC FX options previously exercised and scheduled for settlement on such date:

1. Net settlement obligation per currency calculated for each clearing firm due to and from the CCP from that clearing firm (i.e., the cash flows in the form of “pay-ins” and “pay-outs”).
2. Currency specific pay-ins converted to USD equivalents using historical WM/Reuters rates for the purpose of identifying the two clearing firms with the largest combined settlement obligation to the CCP.
 - A. Analysis “without offset” – aggregation of the pay-ins due from two firms to the CCP.
 - B. Analysis “with offset” – aggregation of the pay-ins due from two firms to the CCP and offsetting any pay-outs due to such two firms from the CCP. This assumes no pay-outs to any clearing firm until all settlement obligations are received from all clearing firms.

Significance of FX Options in OTC FX Market

BIS Triennial Survey 2010 OTC FX Market Turnover^{[1][2]} (in USD equivalent)



[1] from "Triennial Central Bank Survey: Report on global foreign exchange market activity in 2010" published by the Bank for International Settlements (BIS) in Dec 2010.

[2] preliminary results have been released for 2013, but 2010 statistics are represented for ease of comparison with data collected by GFMA Global FX Division; 2013 results indicate growth in options to 337 bn (representing a one percent increase).

Synopsis of OTC FX Options Data Collected by GFMA Global FX Division

Vanilla, European Style

Currencies	
Traded	62
Exercised	53

April 2010 trade date, with expiry before Jan 2012^[3]

	Number of Sides		Number of Trades		Average Daily Gross Notional Value	
	Interdealer Market (Dealer – Dealer)	Client Market (Dealer – Client)	Interdealer Market (Dealer – Dealer)	Client Market (Dealer – Client)	Interdealer Market (Dealer – Dealer)	Client Market (Dealer – Client)
TOTAL	235,548		117,774		125.70 billion	

Breakdown

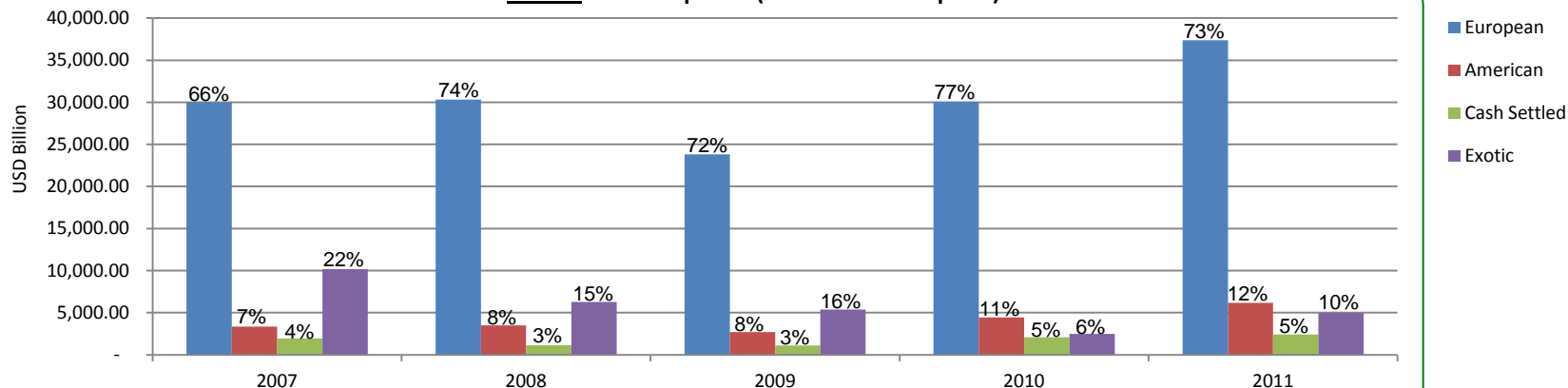
	Exercised					
	19,556	80,022	9,778	40,011	22.44 billion	24.39 billion
Expired	27,546	99,038	13,773	49,519	34.81 billion	34.44 billion
Cancelled/Terminated	826	8,560	413	4,280	3.53 billion	6.09 billion
Subtotal	47,928	187,620	23,964	93,810	60.78 billion	64.92 billion

[3] data from Apr 2010 is represented in above table for ease of comparison with BIS Triennial Survey 2010, which is based on Apr 2010 market activity

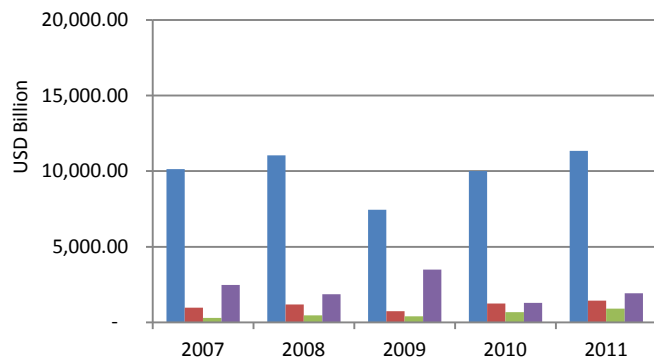
Indication of Relative Product Composition of OTC FX Options Market – European, American, Cash Settled & Exotic

GROSS NOTIONAL VALUE BY YEAR

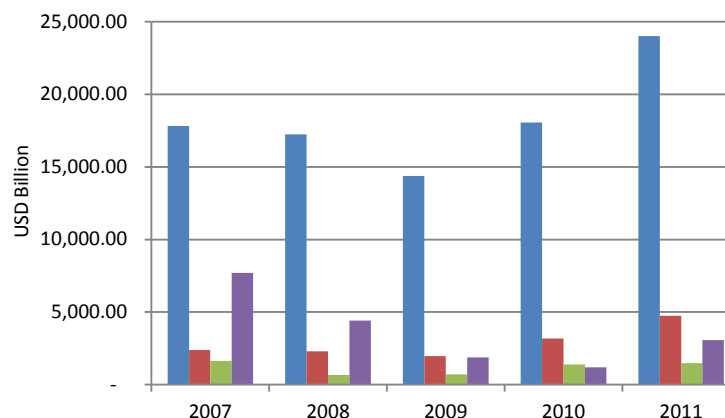
Traded OTC FX Options (Exercised and Expired)



Exercised OTC FX Options



Expired OTC FX Options



- Data collected from GFMA Global FX Division (GFXD) member firms (22) who represent 90% of FX dealer flow. Includes trades w/other GFXD firms ("inter-dealer" market), and non-GFXD firms (clients & other dealers)
- Expiry date on or between January 2007 – December 2011
- Transaction data collected from 22 GFXD firms for OTC FX vanilla options, European style, executed on basis of physical settlement
- With respect to other OTC FX options, summary data collected from 22 GFXD member firms for American style, executed on basis of physical settled, and exotics; and from 20 GFXD member firms for cash-settled

Illustration of Calculation Used to Size Same Day Liquidity Shortfall – Overall Peak (Net Settlement Obligations)

STEP 1

Currency Specific Net Settlement Obligations Due to and from CCP
Resulting from Previously Exercised Deliverable OTC FX Options
Between Five Clearing Firms on a Given Settlement Date

	USD	EUR	GBP	AUD	JPY	CHF	CAD
Spot ref	1	0.729341405	0.635930048	0.970920918	76.45	0.8852	0.99215
Bank A	805,000,000	(200,000,000)	0	(500,000,000)	0	0	0
Bank B	(500,000,000)	(1,000,000,000)	900,000,000	0	0	0	460,000,000
Bank C	475,000,000	0	0	750,000,000	(90,000,000,000)	0	0
Bank D	(140,000,000)	200,000,000	(400,000,000)	0	70,000,000,000	0	(460,000,000)
Bank E	(640,000,000)	1,000,000,000	(500,000,000)	(250,000,000)	20,000,000,000	0	0

Note: As illustrated on this slide 11, net settlement obligations are equal to net funding for the day.

STEP 2

USD Equivalent Net Settlement Obligations Due to CCP
Resulting from Previously Exercised Deliverable OTC FX Options
Between Five Clearing Firms on a Given Settlement Date

	USD	EUR	GBP	AUD	JPY	CHF	CAD	TOTAL	RANKING
Bank A	0	(274,220,000)	0	(514,975,000)	0	0	0	(789,195,000)	5
Bank B	(500,000,000)	(1,371,100,000)	0	0	0	0	0	(1,871,100,000)	1
Bank C	0	0	0	0	(1,177,240,026)	0	0	(1,177,240,026)	4
Bank D	(140,000,000)	0	(629,000,000)	0	0	0	(463,639,571)	(1,232,639,571)	3
Bank E	(640,000,000)	0	(786,250,000)	(257,487,500)	0	0	0	(1,683,737,500)	2

STEP 3

USD Equivalent of Combined Net Settlement Obligations of Largest 2 Clearing Firms on a Given Settlement Date

	USD	EUR	GBP	AUD	JPY	CHF	CAD	TOTAL
Bank A								
Bank B	(500,000,000)	(1,371,100,000)	1,415,250,000	0	0	0	463,639,571	
Bank C								
Bank D								
Bank E	(640,000,000)	1,371,100,000	(786,250,000)	(257,487,500)	261,608,895	0	0	
TOTAL without offset	(1,140,000,000)	(1,371,100,000)	(786,250,000)	(257,487,500)	0	0	0	(3,554,837,500)
TOTAL with offset	(1,140,000,000)	0	0	(257,487,500)	0	0	0	(1,397,487,500)

Same Day Liquidity Shortfall (Cover 2 Liquidity Requirement)

Note: the same two firms on any given day might not result in largest liquidity shortfall under "without offset" and "with offset" for that day

Illustration of Calculation Used to Size Same Day Liquidity Shortfall – Currency Specific Peaks (Net Settlement Obligations)

STEP 1

Currency Specific Net Settlement Obligations Due to and from CCP
Resulting from Previously Exercised Deliverable OTC FX Options
Between Five Clearing Firms on a Given Settlement Date

	USD	EUR	GBP	AUD	JPY	CHF	CAD
Spot ref	1	0.729341405	0.635930048	0.970920918	76.45	0.8852	0.99215
Bank A	805,000,000	(200,000,000)	0	(500,000,000)	0	0	0
Bank B	(500,000,000)	(1,000,000,000)	900,000,000	0	0	0	460,000,000
Bank C	475,000,000	0	0	750,000,000	(90,000,000,000)	0	0
Bank D	(140,000,000)	200,000,000	(400,000,000)	0	70,000,000,000	0	(460,000,000)
Bank E	(640,000,000)	1,000,000,000	(500,000,000)	(250,000,000)	20,000,000,000	0	0

Note: As illustrated on this slide 12, net settlement obligations are equal to net funding for the day.

STEP 2

USD Equivalent Net Settlement Obligations Due to CCP
Resulting from Previously Exercised Deliverable OTC FX Options
Between Five Clearing Firms on a Given Settlement Date

	USD	EUR	GBP	AUD	JPY	CHF	CAD	TOTAL
Bank A	0	(274,220,000)	0	(514,975,000)	0	0	0	(789,195,000)
Bank B	(500,000,000)	(1,371,100,000)	0	0	0	0	0	(1,871,100,000)
Bank C	0	0	0	0	(1,177,240,026)	0	0	(1,177,240,026)
Bank D	(140,000,000)	0	(629,000,000)	0	0	0	(463,639,571)	(1,232,639,571)
Bank E	(640,000,000)	0	(786,250,000)	(257,487,500)	0	0	0	(1,683,737,500)

STEP 3

Currency Peaks – USD Equivalent of Combined Net Settlement Obligations of Largest 2 Clearing Firms on a Given Settlement Date

	USD	EUR	GBP	AUD	JPY	CHF	CAD	TOTAL
Bank A		(274,220,000)		(514,975,000)				
Bank B	(500,000,000)	(1,371,100,000)						
Bank C					(1,177,240,026)			
Bank D			(629,000,000)				(463,639,571)	
Bank E	(640,000,000)		(786,250,000)	(257,487,500)				
TOTAL	(1,140,000,000)	(1,645,320,000)	(1,415,250,000)	(772,462,500)	(1,177,240,026)	0	(463,639,571)	(6,613,912,097)

Same Day
Liquidity
Shortfall
(Cover 2
Liquidity
Requirement)

Illustration of Calculation Used to Size Same Day Liquidity Shortfall – Currency Specific Peaks (Gross Settlement Obligations)

Currency Specific Gross Settlement Obligations Due to and from CCP
Resulting from Previously Exercised Deliverable OTC FX Options
Between Five Clearing Firms on a Given Settlement Date

STEP 1

	USD	EUR	GBP	AUD	JPY	CHF	CAD
Spot ref	1	0.729341405	0.635930048	0.970920918	76.45	0.8852	0.99215
Bank A	(100,000,000) 905,000,000	(200,000,000)	0	(600,000,000) 100,000,000	0	0	0
Bank B	(500,000,000)	(2,500,000,000) 1,500,000,000	(1,100,000,000) 2,000,000,000	0	0	0	(100,000,000) 560,000,000
Bank C	475,000,000	0	0	750,000,000	(90,000,000,000)	0	0
Bank D	(440,000,000) 300,000,000	(350,000,000) 550,000,000	(400,000,000)	0	70,000,000,000	0	(460,000,000)
Bank E	(940,000,000) 300,000,000	1,000,000,000	(700,000,000) 200,000,000	(350,000,000) 100,000,000	(20,000,000,000) 40,000,000,000	0	0

Note: Differences between calculations for gross settlement obligations on this slide 13 and net settlement obligations on preceding slide 12 are italicized and highlighted. As illustrated on this slide 13, gross settlement obligations are greater than net funding obligations; and, when compared to slide 12, greater than net settlement obligations.

USD Equivalent Gross Settlement Obligations Due to CCP
Resulting from Previously Exercised Deliverable OTC FX Options
Between Five Clearing Firms on a Given Settlement Date

STEP 2

	USD	EUR	GBP	AUD	JPY	CHF	CAD	TOTAL
Bank A	(100,000,000)	(274,220,000)	0	(617,970,000)	0	0	0	(992,190,000)
Bank B	(500,000,000)	(3,427,750,000)	(1,729,750,000)	0	0	0	(100,791,211)	(5,758,291,211)
Bank C	0	0	0	0	(1,177,240,026)	0	0	(1,177,240,026)
Bank D	(440,000,000)	(479,885,000)	(629,000,000)	0	0	0	(463,639,571)	(2,012,524,571)
Bank E	(940,000,000)	0	(1,100,750,000)	(360,482,500)	(261,608,895)	0	0	(2,662,841,395)

STEP 3

Currency Peaks – USD Equivalent of Combined Gross Settlement Obligations of Largest 2 Clearing Firms on a Given Settlement Date

	USD	EUR	GBP	AUD	JPY	CHF	CAD	TOTAL
Bank A				(617,970,000)				
Bank B	(500,000,000)	(3,427,750,000)	(1,729,750,000)				(100,791,211)	
Bank C					(1,177,240,026)			
Bank D		(479,885,000)					(463,639,571)	
Bank E	(940,000,000)		(1,100,750,000)	(360,482,500)	(261,608,895)			
TOTAL	(1,440,000,000)	(3,907,635,000)	(2,830,500,000)	(978,452,500)	(1,438,848,921)	0	(564,430,782)	(11,159,867,203)

Same Day
Liquidity
Shortfall
(Cover 2
Liquidity
Requirement)

III. Summary Results of Analysis

Summary Results

Size of Same Day Liquidity Shortfall for OTC FX Options— One CCP

QUESTION:

What is the liquidity shortfall which could have resulted from the failure of the two clearing firms representing the largest combined settlement obligation in each currency on any given settlement date with respect to executed OTC FX options that were exercised and due for settlement on such date?

ANSWER:

These figures inform CCPs desiring to clear these deliverable products of the capabilities and resources required to address same day liquidity shortfalls. A CCP must credibly demonstrate (non-failing) clearing firms will be made “whole” in such a failure situation, i.e., that they will receive what they were expecting to receive on the settlement date (i.e., the currencies they purchased).

NOTE:

Transactional data collected revealed OTC FX options exercised in 53 currencies. 17 currencies listed in table represent those currently supported by CLS settlement service.

SETTLEMENT OBLIGATIONS – SINGLE DAY (IN BILLIONS USD EQUIVALENT)

	Overall Peaks															
	Interdealer Market				Interdealer Market with Client Clearing											
	Net		Gross		Via Single GFXD Firm				Via Several (Five) GFXD Firms				Via Single Non-GFXD Firm			
	Net		Gross		Net		Gross		Net		Gross		Net		Gross	
	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day
Without Offset ¹	8.94	10.07	51.71	61.37	10.95	13.77	81.45	126.47	11.32	14.22	56.41	78.76	10.95	13.77	72.40	112.08
With Offset ²	8.81	9.82	NA	NA	10.85	13.15	NA	NA	11.09	13.47	NA	NA	10.85	13.15	NA	NA

¹ Involves aggregation of pay-ins due from two firms to the CCP

² Involves aggregation of pay-ins due from two firms to the CCP and offsetting any pay-outs due to such two firms from the CCP; and assumes no pay-outs to any clearing firm until all settlement obligations are received from all clearing firms. “With Offset” numbers cannot have gross values.

	Currency Specific Peaks															
	Interdealer Market				Interdealer Market with Client Clearing											
	Net		Gross		Via Single GFXD Firm				Via Several (Five) GFXD Firms				Via Single Non-GFXD Firm			
	Net		Gross		Net		Gross		Net		Gross		Net		Gross	
	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day
AUD*	1.93	2.06	2.71	3.54	1.94	2.23	6.89	7.91	1.94	2.23	4.84	5.11	2.09	2.29	6.64	7.58
CAD	1.23	1.47	8.46	10.47	1.38	1.61	9.62	14.77	1.38	1.61	8.73	11.65	1.38	1.61	9.27	13.96
CHF*	2.82	3.02	21.11	21.32	3.69	4.58	21.15	21.55	3.69	4.58	21.48	21.95	3.69	4.58	21.15	21.55
DKK	0.07	0.07	0.07	0.07	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
EUR*	8.51	9.10	24.28	28.32	10.24	12.03	29.71	43.00	10.44	12.23	25.07	30.87	10.24	12.03	27.41	39.63
GBP*	3.06	3.24	4.72	4.86	3.06	3.37	7.35	10.26	3.04	3.31	5.82	6.82	3.06	3.37	7.24	9.40
HKD	1.70	1.70	3.29	3.57	1.70	1.70	3.46	3.62	1.70	1.71	3.44	3.61	1.70	1.70	3.46	3.62
ILS	0.79	0.83	1.76	2.21	1.33	1.47	6.83	8.30	1.33	1.35	5.78	6.62	1.33	1.47	5.98	7.36
JPY*	2.80	3.23	9.91	10.56	3.41	3.81	18.89	26.94	3.41	3.81	11.44	12.80	3.41	3.81	17.32	24.00
KRW	1.62	1.62	2.23	2.23	1.62	1.62	2.81	2.83	1.62	1.62	2.40	2.41	1.62	1.62	2.81	2.83
MXN	1.27	1.35	2.58	2.75	1.45	1.50	5.03	5.16	1.45	1.50	4.74	4.82	1.45	1.50	3.74	3.80
NOK	0.66	0.66	2.10	2.16	0.99	0.99	4.00	4.41	0.99	0.99	3.38	3.52	0.99	0.99	3.82	4.04
NZD	1.06	1.07	2.16	2.17	1.17	1.27	2.85	3.15	1.17	1.27	2.73	2.89	1.17	1.27	2.76	3.01
SEK	1.58	1.61	2.48	2.51	1.22	1.31	4.11	4.31	1.15	1.26	3.03	3.25	1.18	1.27	3.12	3.31
SGD	0.54	0.54	1.16	1.42	0.99	1.36	3.17	4.31	0.99	1.36	3.16	4.27	0.99	1.36	3.17	4.31
USD*	5.94	6.92	16.04	18.94	7.62	9.24	33.02	49.81	8.20	9.95	23.34	25.76	7.62	9.24	29.21	44.03
ZAR	0.93	0.95	1.15	1.15	0.93	0.96	1.56	1.87	0.93	0.97	1.45	1.74	0.93	0.96	1.25	1.31
TOTAL	36.51	39.44	106.21	118.25	43.01	49.32	160.72	212.47	43.70	50.01	131.10	148.36	43.12	49.34	148.62	194.01

• (*) denotes top six currencies in OTC FX options data set

• Transactional data collected from GFMA Global FX Division (GFXD) member firms (22) who represent 90% of FX dealer flow. Includes trades w/other GFXD firms (“inter-dealer” market), and non-GFXD firms (clients & other dealers)

• OTC FX vanilla options, European style, executed on basis of physical settlement

• Expiry date on or between Jan 2007 – Dec 2011

Summary Results

Size of Same Day Liquidity Shortfall for OTC FX Options— Three CCPs

QUESTION:

What is the liquidity shortfall which could have resulted from the failure of the two clearing firms representing the largest combined settlement obligation in each currency on any given settlement date with respect to executed OTC FX options that were exercised and due for settlement on such date?

ANSWER:

These figures inform CCPs desiring to clear these deliverable products of the capabilities and resources required to address same day liquidity shortfalls. A CCP must credibly demonstrate (non-failing) clearing firms will be made “whole” in such a failure situation, i.e., that they will receive what they were expecting to receive on the settlement date (i.e., the currencies they purchased).

NOTE:

Transactional data collected revealed OTC FX options exercised in 53 currencies. 17 currencies listed in table represent those currently supported by CLS settlement service.

SETTLEMENT OBLIGATIONS – SINGLE DAY (IN BILLIONS USD EQUIVALENT)

	Overall Peaks															
	Interdealer Market				Interdealer Market with Client Clearing											
	Net		Gross		Via Single GFXD Firm				Via Several (Five) GFXD Firms				Via Single Non-GFXD Firm			
	Single Day	Three Day	Single Day	Three Day	Net		Gross		Net		Gross		Net		Gross	
					Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day
Without Offset ¹	9.66	15.34	51.71	61.37	13.04	21.64	81.45	126.47	11.83	16.79	56.41	78.76	12.83	21.37	72.40	112.08
With Offset ²	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

¹ Involves aggregation of pay-ins due from two firms to the CCP

² Involves aggregation of pay-ins due from two firms to the CCP and offsetting any pay-outs due to such two firms from the CCP; and assumes no pay-outs to any clearing firm until all settlement obligations are received from all clearing firms. “With Offset” numbers are out of scope for three CCP scenario calculations.

	Currency Specific Peaks															
	Interdealer Market				Interdealer Market with Client Clearing											
	Net		Gross		Via Single GFXD Firm				Via Several (Five) GFXD Firms				Via Single Non-GFXD Firm			
	Single Day	Three Day	Single Day	Three Day	Net		Gross		Net		Gross		Net		Gross	
					Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day
AUD*	2.07	2.26	2.71	3.54	2.14	2.49	6.89	7.91	2.14	2.49	4.84	5.11	2.14	2.49	6.64	7.58
CAD	1.28	1.75	8.46	10.47	1.41	1.68	9.62	14.77	1.39	1.78	8.73	11.65	1.41	1.67	9.27	13.96
CHF*	3.63	3.84	21.11	21.32	3.69	4.98	21.15	21.55	3.69	4.98	21.48	21.95	3.69	4.98	21.15	21.55
DKK	0.07	0.07	0.07	0.07	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
EUR*	8.55	9.45	24.28	28.32	10.24	12.30	29.71	43.00	10.44	12.7	25.07	30.87	10.24	12.30	27.41	39.63
GBP*	3.06	3.41	4.72	4.86	3.06	3.55	7.35	10.26	3.06	3.55	5.82	6.82	3.06	3.55	7.24	9.40
HKD	1.70	1.70	3.29	3.57	1.70	1.70	3.46	3.62	1.70	1.71	3.44	3.61	1.70	1.70	3.46	3.62
ILS	0.79	0.83	1.76	2.21	1.56	1.56	6.83	8.30	1.52	1.52	5.78	6.62	1.56	1.56	5.98	7.36
JPY*	3.15	3.96	9.91	10.56	3.76	5.17	18.89	26.94	3.65	5.14	11.44	12.80	3.76	4.94	17.32	24.00
KRW	1.87	1.87	2.23	2.23	1.87	1.87	2.81	2.83	1.87	1.87	2.40	2.41	1.87	1.87	2.81	2.83
MXN	1.38	1.43	2.58	2.75	1.96	1.97	5.03	5.16	1.56	1.56	4.74	4.82	1.95	1.96	3.74	3.80
NOK	0.66	0.66	2.10	2.16	1.00	1.02	4.00	4.41	1.00	1.02	3.38	3.52	1.00	1.02	3.82	4.04
NZD	1.06	1.07	2.16	2.17	1.17	1.29	2.85	3.15	1.17	1.29	2.73	2.89	1.17	1.29	2.76	3.01
SEK	1.58	1.61	2.48	2.51	1.44	1.58	4.11	4.31	1.28	1.43	3.03	3.25	1.40	1.55	3.12	3.31
SGD	0.54	0.54	1.16	1.42	0.99	1.36	3.17	4.31	0.99	1.36	3.16	4.27	0.99	1.36	3.17	4.31
USD*	6.69	7.69	16.04	18.94	8.01	9.63	33.02	49.81	8.53	10.29	23.34	25.76	8.01	9.63	29.21	44.03
ZAR	0.93	0.96	1.15	1.15	0.93	0.97	1.56	1.87	0.93	0.98	1.45	1.74	0.93	0.97	1.25	1.31
TOTAL	39.01	43.10	106.21	118.25	45.20	53.39	160.72	212.47	45.19	53.94	131.10	148.36	45.15	53.11	148.62	194.01

• (*) denotes top six currencies in OTC FX options data set

• Transactional data collected from GFMA Global FX Division (GFXD) member firms (22) who represent 90% of FX dealer flow. Includes trades w/other GFXD firms (“inter-dealer” market), and non-GFXD firms (clients & other dealers)

• OTC FX vanilla options, European style, executed on basis of physical settlement

• Expiry date on or between Jan 2007 – Dec 2011

Summary Results

Size of Same Day Liquidity Shortfall for OTC FX Options— Five CCPs

QUESTION:

What is the liquidity shortfall which could have resulted from the failure of the two clearing firms representing the largest combined settlement obligation in each currency on any given settlement date with respect to executed OTC FX options that were exercised and due for settlement on such date?

ANSWER:

These figures inform CCPs desiring to clear these deliverable products of the capabilities and resources required to address same day liquidity shortfalls. A CCP must credibly demonstrate (non-failing) clearing firms will be made “whole” in such a failure situation, i.e., that they will receive what they were expecting to receive on the settlement date (i.e., the currencies they purchased).

NOTE:

Transactional data collected revealed OTC FX options exercised in 53 currencies. 17 currencies listed in table represent those currently supported by CLS settlement service.

SETTLEMENT OBLIGATIONS – SINGLE DAY (IN BILLIONS USD EQUIVALENT)

	Overall Peaks															
	Interdealer Market				Interdealer Market with Client Clearing											
	Net		Gross		Via Single GFXD Firm				Via Several (Five) GFXD Firms				Via Single Non-GFXD Firm			
	Single Day	Three Day	Single Day	Three Day	Net		Gross		Net		Gross		Net		Gross	
					Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day
Without Offset ¹	10.75	17.51	51.71	61.37	13.76	23.79	81.45	126.47	12.32	19.19	56.41	78.76	13.47	23.39	72.40	112.08
With Offset ²	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

¹ Involves aggregation of pay-ins due from two firms to the CCP

² Involves aggregation of pay-ins due from two firms to the CCP and offsetting any pay-outs due to such two firms from the CCP; and assumes no pay-outs to any clearing firm until all settlement obligations are received from all clearing firms. “With Offset” numbers are out of scope for the five CCP scenario calculations.

	Currency Specific Peaks															
	Interdealer Market				Interdealer Market with Client Clearing											
	Net		Gross		Via Single GFXD Firm				Via Several (Five) GFXD Firms				Via Single Non-GFXD Firm			
	Single Day	Three Day	Single Day	Three Day	Net		Gross		Net		Gross		Net		Gross	
					Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day	Single Day	Three Day
AUD*	2.02	2.25	2.71	3.54	2.20	2.41	6.89	7.91	2.20	2.41	4.84	5.11	2.20	2.41	6.64	7.58
CAD	1.28	1.75	8.46	10.47	2.16	2.27	9.62	14.77	2.07	2.23	8.73	11.65	2.16	2.28	9.27	13.96
CHF*	3.66	3.87	21.11	21.32	4.00	5.47	21.15	21.55	4.00	5.47	21.48	21.95	4.00	5.47	21.15	21.55
DKK	0.07	0.07	0.07	0.07	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
EUR*	8.55	9.52	24.28	28.32	10.26	12.40	29.71	43.00	10.47	12.81	25.07	30.87	10.26	12.40	27.41	39.63
GBP*	3.06	3.42	4.72	4.86	3.06	3.56	7.35	10.26	3.06	3.56	5.82	6.82	3.06	3.56	7.24	9.40
HKD	1.70	1.70	3.29	3.57	1.70	1.70	3.46	3.62	1.70	1.71	3.44	3.61	1.70	1.70	3.46	3.62
ILS	0.79	0.83	1.76	2.21	1.82	1.82	6.83	8.30	1.65	1.65	5.78	6.62	1.82	1.82	5.98	7.36
JPY*	3.22	4.09	9.91	10.56	3.90	6.08	18.89	26.94	3.82	5.44	11.44	12.8	3.91	5.86	17.32	24.00
KRW	1.87	1.87	2.23	2.23	1.87	1.87	2.81	2.83	1.87	1.87	2.40	2.41	1.87	1.87	2.81	2.83
MXN	1.38	1.43	2.58	2.75	2.06	2.07	5.03	5.16	1.56	1.56	4.74	4.82	2.05	2.06	3.74	3.80
NOK	0.66	0.66	2.10	2.16	1.01	1.13	4.00	4.41	1.01	1.13	3.38	3.52	1.01	1.13	3.82	4.04
NZD	1.13	1.15	2.16	2.17	1.35	1.42	2.85	3.15	1.25	1.39	2.73	2.89	1.35	1.42	2.76	3.01
SEK	1.59	1.62	2.48	2.51	1.46	1.59	4.11	4.31	1.28	1.43	3.03	3.25	1.42	1.55	3.12	3.31
SGD	0.54	0.54	1.16	1.42	0.99	1.36	3.17	4.31	0.99	1.36	3.16	4.27	0.99	1.36	3.17	4.31
USD*	6.75	7.77	16.04	18.94	8.03	9.75	33.02	49.81	8.54	10.41	23.34	25.76	8.03	9.75	29.21	44.03
ZAR	0.93	0.96	1.15	1.15	0.93	0.97	1.56	1.87	0.93	0.98	1.45	1.74	0.93	0.97	1.25	1.31
TOTAL	39.20	43.51	106.21	118.25	47.07	56.14	160.72	212.47	46.67	55.68	131.10	148.36	47.03	55.88	148.62	194.01

• (*) denotes top six currencies in OTC FX options data set

• Transactional data collected from GFMA Global FX Division (GFXD) member firms (22) who represent 90% of FX dealer flow. Includes trades w/other GFXD firms (“inter-dealer” market), and non-GFXD firms (clients & other dealers)

• OTC FX vanilla options, European style, executed on basis of physical settlement

• Expiry date on or between Jan 2007 – Dec 2011

Summary Results

Multilateral Netting Efficiencies – highest single day across all currencies for all firms by year

The table below illustrates the power of multilateral netting used by a CCP to calculate the *total* settlement obligations due from all clearing firms

- **Total Gross Notional Value** = sum of “sold” currency amounts for *all* valid trades, then *aggregated* across *all* clearing firms
- **Total Net Settlement Obligation** = sum of currency amounts payable to CCP, after netting sold amounts with purchased amounts for each currency for each firm, converted to USD equivalent and then *aggregated* across *all* clearing firms

HIGHEST PAYMENT REDUCTION BENEFIT (SINGLE DAY)

	Interdealer Market				Interdealer Market with Client Clearing											
	In USD equiv, billions		Net % of Gross	Payment Reduction Benefit	Via Single GFXD Firm				Via Several (5) GFXD Firms				Via Single Non-GFXD Firm			
					In USD equiv, billions		Net % of Gross	Payment Reduction Benefit	In USD equiv, billions		Net % of Gross	Payment Reduction Benefit	In USD equiv, billions		Net % of Gross	Payment Reduction Benefit
	Total Net Settlement Obligation	Total Gross Notional Value			Total Net Settlement Obligation	Total Gross Notional Value			Total Net Settlement Obligation	Total Gross Notional Value						
	Total Net Settlement Obligation	Total Gross Notional Value			Total Net Settlement Obligation	Total Gross Notional Value			Total Net Settlement Obligation	Total Gross Notional Value						
Total Gross Notional Value																
2007	12.46	81.97	15.20%	84.80%	17.72	165.3	10.72%	89.28%	20.79	165.3	12.58%	87.42%	17.78	165.3	10.75%	89.25%
2008	9.50	67.93	13.99%	86.01%	9.31	87.38	10.66%	89.34%	10.08	87.39	11.53%	88.47%	9.42	87.38	10.78%	89.22%
2009	9.90	59.18	16.73%	83.27%	11.77	90.52	13.02%	86.98%	12.42	93.24	13.32%	86.68%	12.11	90.52	13.38%	86.62%
2010	7.22	35.24	20.49%	79.51%	13.63	104.82	13.00%	87.00%	14.59	105.31	13.86%	86.14%	13.92	104.82	13.28%	86.72%
2011	8.39	75.03	11.19%	88.81%	11.56	104.53	11.06%	88.94%	11.36	104.53	10.86%	89.14%	11.73	104.53	11.22%	88.78%
Three CCPs																
2007	18.05	65.61	27.52%	72.48%	23.15	114.25	20.26%	79.74%	21.89	114.25	19.16%	80.84%	22.06	114.25	19.30%	80.70%
2008	8.71	37.84	23.02%	76.98%	13.54	87.38	15.50%	84.50%	13.08	87.38	14.97%	85.03%	13.19	87.38	15.09%	84.91%
2009	15.23	59.18	25.74%	74.26%	24.23	111.07	21.82%	78.18%	4.88	22.92	21.29%	78.71%	4.88	22.92	21.31%	78.69%
2010	15.21	48.55	31.32%	68.68%	22.63	104.82	21.59%	78.41%	22.09	104.82	21.07%	78.93%	22.49	104.82	21.45%	78.55%
2011	17.04	75.03	22.71%	77.29%	7.70	46.43	16.59%	83.41%	7.49	46.43	16.12%	83.88%	7.54	46.43	16.24%	83.76%
Five CCPs																
2007	19.60	65.61	29.88%	70.12%	26.20	114.25	22.93%	77.07%	10.07	44.29	22.73%	77.27%	26.54	114.25	23.23%	76.77%
2008	9.60	37.84	25.36%	74.64%	15.83	87.38	18.12%	81.88%	15.82	87.38	18.10%	81.90%	16.00	87.38	18.31%	81.69%
2009	18.15	59.18	30.67%	69.33%	5.60	22.92	24.42%	75.58%	5.62	22.92	24.54%	75.46%	5.65	22.92	24.64%	75.36%
2010	15.10	39.76	37.98%	62.02%	27.25	104.82	26.00%	74.00%	26.31	104.82	25.10%	80.60%	18.03	68.92	26.15%	73.85%
2011	19.26	75.03	25.67%	74.33%	36.63	167.75	21.83%	78.17%	35.52	167.75	21.18%	78.82%	37.10	167.75	22.12%	77.88%

IV. Detailed Results of Analysis

(One CCP – Calculations Based on Net Settlement Obligations)

Size of Liquidity Shortfall Interdealer Market—*Without Offset*

QUESTION:

What is the liquidity shortfall which could have resulted from the failure of the two clearing firms representing the largest combined settlement obligation in each currency on any given settlement date with respect to executed OTC FX options that were exercised and due for settlement on such date?

ANSWER: 8.94 billion

This figure informs CCPs desiring to clear these deliverable products of the capabilities and resources required to address same day liquidity shortfalls. A CCP must credibly demonstrate (non-failing) clearing firms will be made “whole” in such a failure situation, i.e., that they will receive what they were expecting to receive on the settlement date (i.e., the currencies they purchased).

3 day scenario

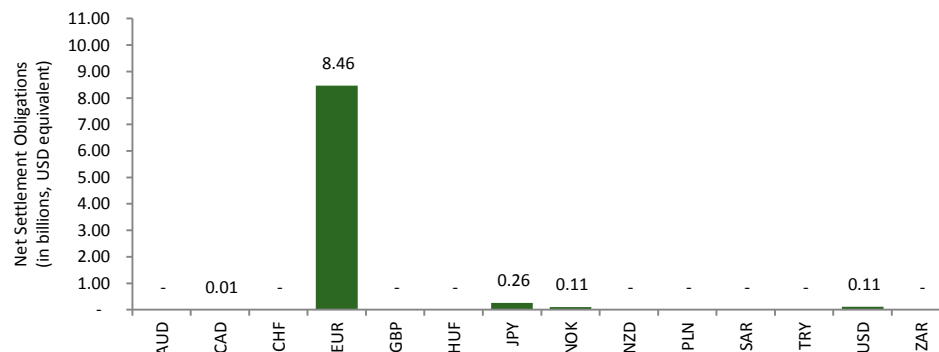
Provides an indication of CCP’s liquidity challenge on failure date + 1 and failure date + 2 relating to OTC FX options exercised on failure date or on failure date – 1.

Net Overall Peaks Without Offset

Largest Single Day	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
In USD equivalent	8.94 bn	0.33 bn	0.80 bn	111.56 bn
Date	Sep 14, 2010	Sep 15, 2010	Sep 16, 2010	
2 nd Largest Single Day	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
In USD equivalent	8.64 bn	1.09 bn	0.73 bn	278.43 bn
Date	Jan 23, 2009	Jan 26, 2009	Jan 27, 2009	

Largest 1-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	4.86 bn	5.50 bn	8.64 bn	8.94 bn	7.89 bn
Date	Jul 5, 2007	Feb 19, 2008	Jan 23, 2009	Sep 14, 2010	Oct 11, 2011
Average (in USD equivalent)	1.90 bn	1.87 bn	1.42 bn	1.60 bn	1.66 bn
Standard Deviation (in USD)	0.71	0.82	0.74	0.81	0.74
Largest 3-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	7.00 bn	7.13	10.45 bn	10.07 bn	9.02 bn
Date Range	Jul 5-9, 2007	Feb 19-21, 2008	Jan 23-27, 2009	Sep 14-16, 2010	Oct 11-13, 2011

**Largest Single Day
Currency Breakdown
Sep 14, 2010**



Size of Liquidity Shortfall

Interdealer Market with Client Clearing via *Single GFXD Dealer—Without Offset*

QUESTION:

What is the liquidity shortfall which could have resulted from the failure of the two clearing firms representing the largest combined settlement obligation in each currency on any given settlement date with respect to executed OTC FX options that were exercised and due for settlement on such date?

ANSWER: 10.95 billion

This figure informs CCPs desiring to clear these deliverable products of the capabilities and resources required to address same day liquidity shortfalls. A CCP must credibly demonstrate (non-failing) clearing firms will be made "whole" in such a failure situation, i.e., that they will receive what they were expecting to receive on the settlement date (i.e., the currencies they purchased).

3 day scenario

Provides an indication of CCP's liquidity challenge on failure date + 1 and failure date + 2 relating to OTC FX options exercised on failure date or on failure date - 1.

Net Overall Peaks Without Offset

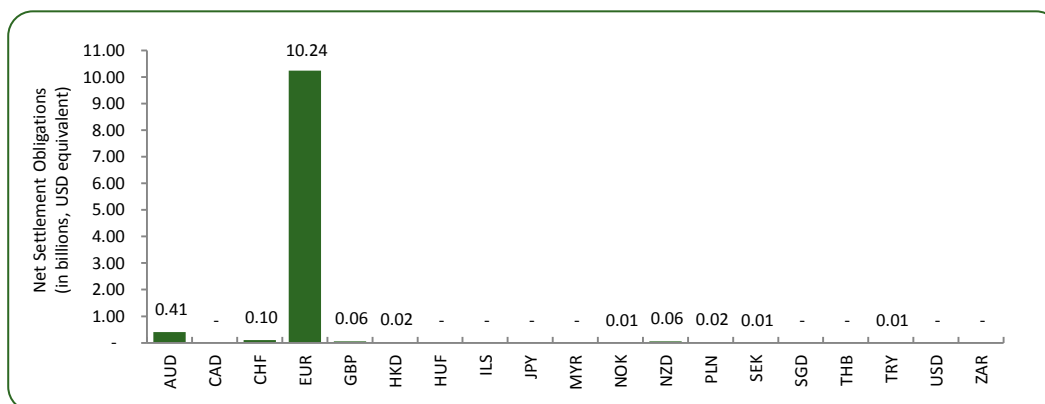
Largest Single Day	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
In USD equivalent	10.95 bn	1.80 bn	1.02 bn	178.36 bn
Date	Oct 11, 2011	Oct 12, 2011	Oct 13, 2011	
% attributable to client positions*	29.68 %	103.33 %	93.14 %	

2 nd Largest Single Day	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
In USD equivalent	10.08 bn	1.08 bn	2.44 bn	878.94 bn
Date	Sep 14, 2010	Sep 15, 2010	Sep 16, 2010	
% attributable to client positions*	14.58 %	84.26 %	77.46 %	

Largest 1-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	7.79 bn	8.95 bn	9.98 bn	10.08 bn	10.95 bn
Date	Jul 17, 2007	Feb 19, 2008	May 15, 2009	Sep 14, 2010	Oct 11, 2011
Average (in USD equivalent)	3.06 bn	3.13 bn	2.25 bn	2.47 bn	2.68 bn
Standard Deviation (in USD)	1.20 bn	1.36 bn	1.11 bn	1.13 bn	1.19 bn

Largest 3-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	12.79 bn	11.93 bn	13.98 bn	13.60 bn	13.77 bn
Date Range	Jul 17-19, 2007	Feb 19-21, 2008	May 15-19, 2009	Sep 14-16, 2010	Oct 11-13, 2011

**Largest Single Day
Currency Breakdown
Oct 11, 2011**



* Calculated based on settlement obligations of clients of relevant GFMA Global FX Division (GFXD) member firm(s), divided by sum of settlement obligations of relevant GFXD member firm(s) and such clients
 * Transactional data collected from GFXD member firms (22) who represent 90% of FX dealer flow. Includes trades w/other GFXD firms ("inter-dealer" market), and non-GFXD firms (clients & other dealers)
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 * Expiry date on or between Jan 2007 – Dec 2011

Size of Liquidity Shortfall

Interdealer Market with Client Clearing via *Several (5) GFXD Members—Without Offset*

QUESTION:

What is the liquidity shortfall which could have resulted from the failure of the two clearing firms representing the largest combined settlement obligation in each currency on any given settlement date with respect to executed OTC FX options that were exercised and due for settlement on such date?

ANSWER: 11.32 billion

This figure informs CCPs desiring to clear these deliverable products of the capabilities and resources required to address same day liquidity shortfalls. A CCP must credibly demonstrate (non-failing) clearing firms will be made "whole" in such a failure situation, i.e., that they will receive what they were expecting to receive on the settlement date (i.e., the currencies they purchased).

3 day scenario

Provides an indication of CCP's liquidity challenge on failure date + 1 and failure date + 2 relating to OTC FX options exercised on failure date or on failure date - 1.

Net Overall Peaks Without Offset

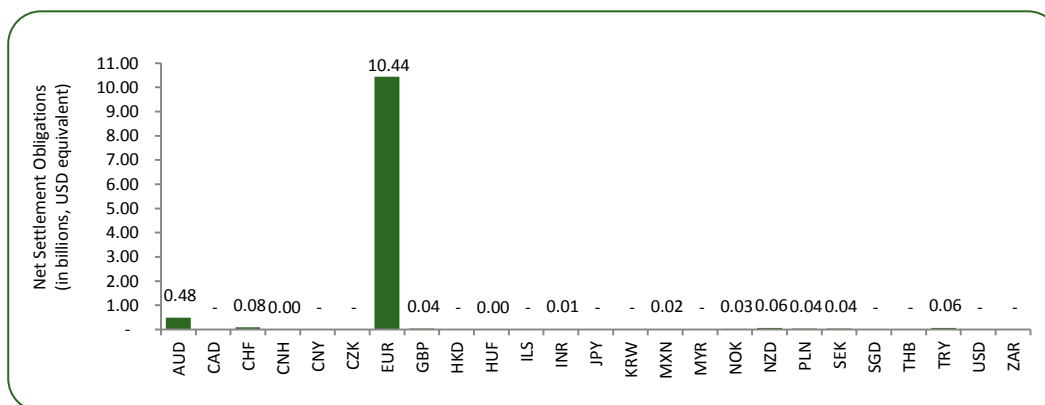
Largest Single Day In USD equivalent	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
	11.32 bn	1.72 bn	1.18 bn	244.01 bn
Date	Oct 11, 2011	Oct 12, 2011	Oct 13, 2011	
% attributable to client positions*	32.77%	122.09%	101.69%	

2 nd Largest Single Day In USD equivalent	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
	10.01 bn	2.03 bn	1.49 bn	788.67 bn
Date	Jan 23, 2009	Jan 26, 2009	Jan 27, 2009	
% attributable to client positions*	34.37%	72.41%	83.22%	

Largest 1-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	6.73 bn	6.52 bn	10.01 bn	9.26 bn	11.32 bn
Date	Jul 17, 2007	Oct 14, 2008	Jan 23, 2009	Sep 14, 2010	Oct 11, 2011
Average (in USD equivalent)	2.67 bn	2.74 bn	2.05 bn	2.23 bn	2.39 bn
Standard Deviation (in USD)	1.04	1.16	1.01	1.03	1.08

Largest 3-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	10.64 bn	10.38 bn	13.54 bn	11.16 bn	14.22 bn
Date Range	Jul 17-19, 2007	Oct 14-16, 2008	Jan 23-27, 2009	Sep 14-16, 2010	Oct 11-13, 2011

**Largest Single Day
Currency Breakdown
Oct 11, 2011**



* Calculated based on settlement obligations of clients of relevant GFMA Global FX Division (GFXD) member firm(s), divided by sum of settlement obligations of relevant GFXD member firm(s) and such clients
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 • Expiry date on or between Jan 2007 – Dec 2011

Size of Liquidity Shortfall

Interdealer Market with Client Clearing via *Single Non-GFXD Dealer—Without Offset*

QUESTION:

What is the liquidity shortfall which could have resulted from the failure of the two clearing firms representing the largest combined settlement obligation in each currency on any given settlement date with respect to executed OTC FX options that were exercised and due for settlement on such date?

ANSWER: 10.95 billion

This figure informs CCPs desiring to clear these deliverable products of the capabilities and resources required to address same day liquidity shortfalls. A CCP must credibly demonstrate (non-failing) clearing firms will be made “whole” in such a failure situation, i.e., that they will receive what they were expecting to receive on the settlement date (i.e., the currencies they purchased).

3 day scenario

Provides an indication of CCP’s liquidity challenge on failure date + 1 and failure date + 2 relating to OTC FX options exercised on failure date or on failure date - 1.

Net Overall Peaks Without Offset

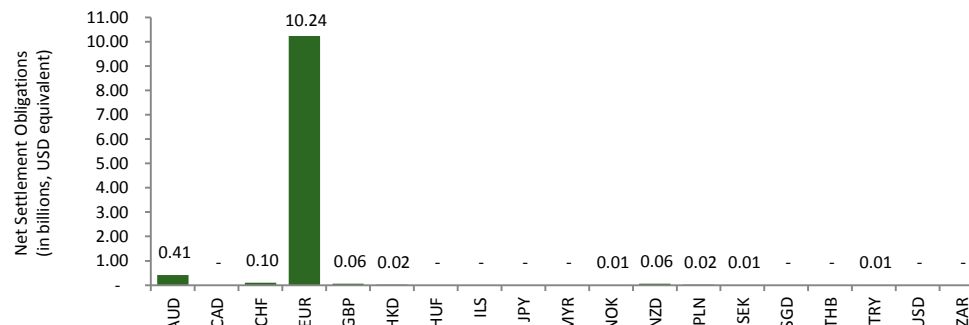
Largest Single Day In USD equivalent	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
	10.95 bn	1.80 bn	1.02 bn	178.36 bn
Date	Oct 11, 2011	Oct 12, 2011	Oct 13, 2011	
% attributable to client positions*	29.68 %	103.33 %	93.14 %	

2 nd Largest Single Day In USD equivalent	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
	10.05 bn	2.28 bn	1.67 bn	1144.25 bn
Date	May 15, 2009	May 18, 2009	May 19, 2009	
% attributable to client positions*	72.34 %	46.93 %	73.65 %	

Largest 1-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	7.68 bn	8.90 bn	10.05 bn	9.76 bn	10.95 bn
Date	Jul 17, 2007	Feb 19, 2008	May 15, 2009	Sep 14, 2010	Oct 11, 2011
Average (in USD equivalent)	3.04	3.10	2.25	2.44	2.64
Standard Deviation (in USD)	1.21	1.35	1.10	1.12	1.19

Largest 3-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	12.96 bn	12.06 bn	14.00 bn	13.12 bn	13.77 bn
Date Range	Jul 17-19, 2007	Feb 19-21, 2008	May 15-19, 2009	Sep 14-16, 2010	Oct 11-13, 2011

**Largest Single Day
Currency Breakdown
Oct 11, 2011**



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Size of Liquidity Shortfall Interdealer Market—With Offset

QUESTION:

What is the liquidity shortfall which could have resulted from the failure of the two clearing firms representing the largest combined settlement obligation in each currency on any given settlement date with respect to executed OTC FX options that were exercised and due for settlement on such date?

ANSWER: 8.81 billion

This figure informs CCPs desiring to clear these deliverable products of the capabilities and resources required to address same day liquidity shortfalls. A CCP must credibly demonstrate (non-failing) clearing firms will be made "whole" in such a failure situation, i.e., that they will receive what they were expecting to receive on the settlement date (i.e., the currencies they purchased).

3 day scenario

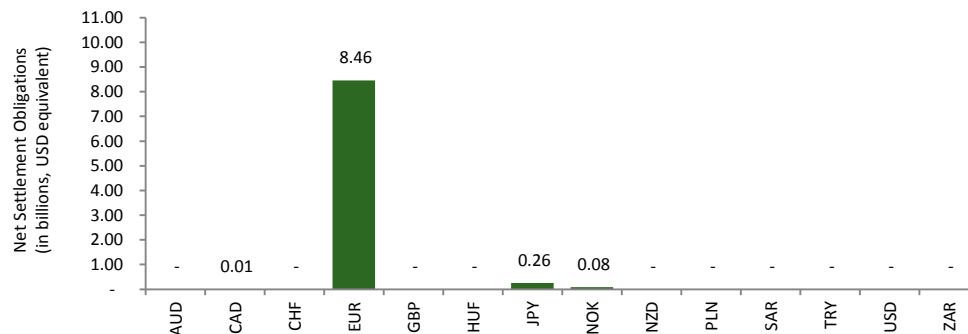
Provides an indication of CCP's liquidity challenge on failure date + 1 and failure date + 2 relating to OTC FX options exercised on failure date or on failure date - 1.

Net Overall Peaks With Offset

Largest Single Day	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
In USD equivalent	8.81 bn	0.32 bn	0.69 bn	111.56 bn
Date	Sep 14, 2010	Sep 15, 2010	Sep 16, 2010	
2 nd Largest Single Day	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
In USD equivalent	7.87	0.73 bn	0.40 bn	68.09 bn
Date	Oct 11, 2011	Oct 12, 2011	Oct 13, 2011	

Largest 1-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	4.21 bn	4.88 bn	6.24 bn	8.81 bn	7.87 bn
Date	Jul 17, 2007	Dec 2, 2008	Jan 23, 2009	Sep 14, 2010	Oct 11, 2011
Average (in USD equivalent)	1.63 bn	1.59 bn	1.22 bn	1.41 bn	1.43 bn
Standard Deviation (in USD)	0.62	0.73	0.61	0.76	0.69
Largest 3-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	6.97 bn	6.60 bn	7.34 bn	9.82 bn	8.99 bn
Date Range	Jul 17-19, 2007	Dec 2-4, 2008	Jan 23-27, 2009	Sep 14-16, 2010	Oct 11-13, 2011

Largest Single Day
Currency Breakdown
Sep 14, 2010



Size of Liquidity Shortfall

Interdealer Market with Client Clearing via *Single GFXD Dealer—With Offset*

QUESTION:

What is the liquidity shortfall which could have resulted from the failure of the two clearing firms representing the largest combined settlement obligation in each currency on any given settlement date with respect to executed OTC FX options that were exercised and due for settlement on such date?

ANSWER: 10.85 billion

This figure informs CCPs desiring to clear these deliverable products of the capabilities and resources required to address same day liquidity shortfalls. A CCP must credibly demonstrate (non-failing) clearing firms will be made "whole" in such a failure situation, i.e., that they will receive what they were expecting to receive on the settlement date (i.e., the currencies they purchased).

3 day scenario

Provides an indication of CCP's liquidity challenge on failure date + 1 and failure date + 2 relating to OTC FX options exercised on failure date or on failure date - 1.

Net Overall Peaks With Offset

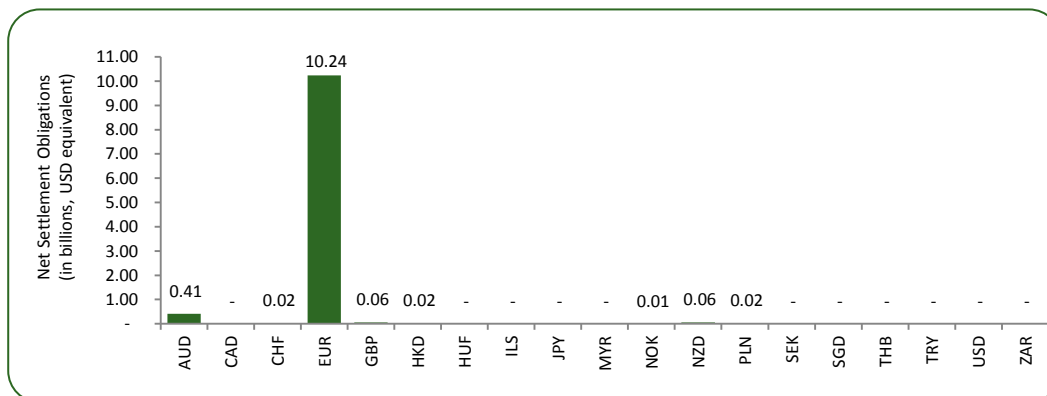
Largest Single Day In USD equivalent	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
	10.85 bn	1.33 bn	0.96 bn	178.36 bn
Date	Oct 11, 2011	Oct 12, 2011	Oct 13, 2011	
% attributable to client positions*	29.95 %	127.82 %	98.96 %	

2 nd Largest Single Day In USD equivalent	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
	8.81 bn	1.07 bn	1.22 bn	878.94 bn
Date	Sep 14, 2010	Sep 15, 2010	Sep 16, 2010	
% attributable to client positions*	16.12 %	74.77 %	130.33 %	

Largest 1-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	6.26 bn	6.14 bn	8.32 bn	8.81 bn	10.85 bn
Date	Jul 17, 2007	Feb 19, 2008	Jan 23, 2009	Sep 14, 2010	Oct 11, 2011
Average (in USD equivalent)	2.38 bn	2.45 bn	1.81 bn	2.03 bn	2.13 bn
Standard Deviation (in USD)	0.97 bn	1.07 bn	0.87 bn	0.94 bn	1.00 bn

Largest 3-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	8.69 bn	8.30 bn	10.43 bn	11.1 bn	13.15 bn
Date Range	Jul 17-19, 2007	Feb 19-21, 2008	Jan 23-27, 2009	Sep 14-16, 2010	Oct 11-13, 2011

**Largest Single Day
Currency Breakdown
Oct 11, 2011**



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Size of Liquidity Shortfall

Interdealer Market with Client Clearing via Several (5) GFXD Members—With Offset

QUESTION:

What is the liquidity shortfall which could have resulted from the failure of the two clearing firms representing the largest combined settlement obligation in each currency on any given settlement date with respect to executed OTC FX options that were exercised and due for settlement on such date?

ANSWER: 11.09 billion

This figure informs CCPs desiring to clear these deliverable products of the capabilities and resources required to address same day liquidity shortfalls. A CCP must credibly demonstrate (non-failing) clearing firms will be made "whole" in such a failure situation, i.e., that they will receive what they were expecting to receive on the settlement date (i.e., the currencies they purchased).

3 day scenario

Provides an indication of CCP's liquidity challenge on failure date + 1 and failure date + 2 relating to OTC FX options exercised on failure date or on failure date - 1.

Net Overall Peaks With Offset

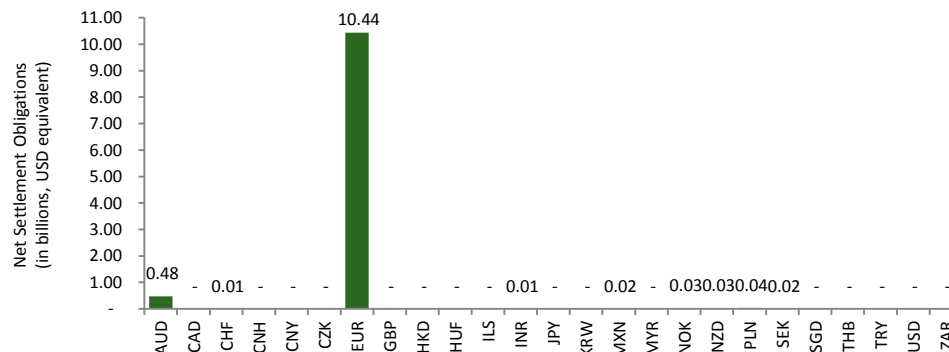
Largest Single Day In USD equivalent	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
	11.09 bn	1.33 bn	1.05 bn	244.01 bn
Date	Oct 11, 2011	Oct 12, 2011	Oct 13, 2011	
% attributable to client positions*	31.74%	142.86%	100.95%	

2 nd Largest Single Day In USD equivalent	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position
	8.74 bn	0.55 bn	1.04 bn	485.9 bn
Date	Sep 14, 2010	Sep 15, 2010	Sep 16, 2010	
% attributable to client positions*	8.01%	105.45%	101.92%	

Largest 1-day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	6.27 bn	5.70 bn	8.49 bn	8.74 bn	11.09 bn
Date	Jul 17, 2007	Nov 28, 2008	Jan 23, 2009	Sep 14, 2010	Oct 11, 2011
Average (in USD equivalent)	2.20 bn	2.28 bn	1.71 bn	1.87 bn	2.02 bn
Standard Deviation (in USD)	0.86	0.97	0.84	0.87	0.98

Largest 3-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	9.09 bn	8.37 bn	10.99 bn	10.32 bn	13.47 bn
Date Range	Jul 17-19, 2007	Nov 28 - Dec 2, 2008	Jan 23-27, 2009	Sep 14-16, 2010	Oct 11-13, 2011

**Largest Single Day
Currency Breakdown
Oct 11, 2011**



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Size of Liquidity Shortfall

Interdealer Market with Client Clearing via *Single Non-GFXD Dealer—With Offset*

QUESTION:

What is the liquidity shortfall which could have resulted from the failure of the two clearing firms representing the largest combined settlement obligation in each currency on any given settlement date with respect to executed OTC FX options that were exercised and due for settlement on such date?

ANSWER: 10.85 billion

This figure informs CCPs desiring to clear these deliverable products of the capabilities and resources required to address same day liquidity shortfalls. A CCP must credibly demonstrate (non-failing) clearing firms will be made "whole" in such a failure situation, i.e., that they will receive what they were expecting to receive on the settlement date (i.e., the currencies they purchased).

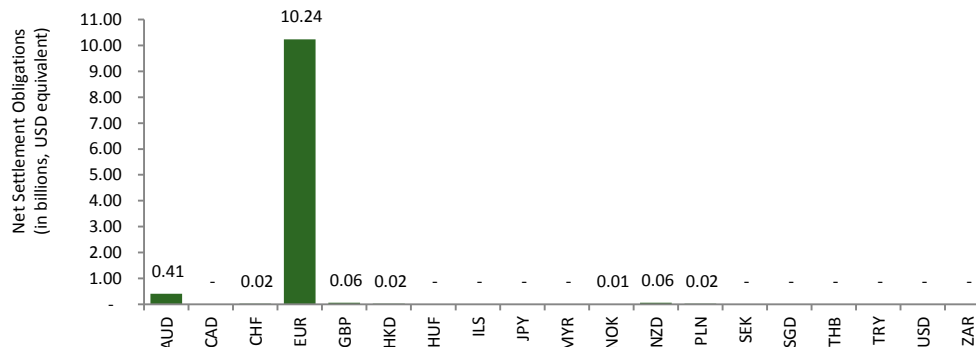
3 day scenario

Provides an indication of CCP's liquidity challenge on failure date + 1 and failure date + 2 relating to OTC FX options exercised on failure date or on failure date - 1.

Net Overall Peaks With Offset

Largest Single Day	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position	
In USD equivalent	10.85 bn	1.33 bn	0.96 bn	178.36 bn	
Date	Oct 11, 2011	Oct 12, 2011	Oct 13, 2011		
% attributable to client positions*	29.95 %	127.82 %	98.96 %		
2 nd Largest Single Day	Settlement Date	Settlement Date + 1	Settlement Date + 2	Remaining Open Position	
In USD equivalent	8.69 bn	0.26 bn	0.69 bn	145.08 bn	
Date	Sep 14, 2010	Sep 15, 2010	Sep 16, 2010		
% attributable to client positions*	5.52 %	34.62 %	34.78 %		
Largest 1-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	6.26 bn	6.09 bn	8.32 bn	8.69 bn	10.85 bn
Date	Jul 17, 2007	Feb 19, 2008	Jan 23, 2009	Sep 14, 2010	Oct 11, 2011
Average (in USD equivalent)	2.37 bn	2.42 bn	1.81 bn	2.01 bn	2.11 bn
Standard Deviation (in USD)	0.97 bn	1.05 bn	0.87 bn	0.94 bn	1.01 bn
Largest 3-Day Scenario by Year	2007	2008	2009	2010	2011
In USD equivalent	8.69 bn	8.24 bn	10.43 bn	9.64 bn	13.15 bn
Date Range	Jul 17-19, 2007	Feb 19-21, 2008	Jan 23-27, 2009	Sep 14-16, 2010	Oct 11-13, 2011

**Largest Single Day
Currency Breakdown
Oct 11, 2011**



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V. Other Data Observations

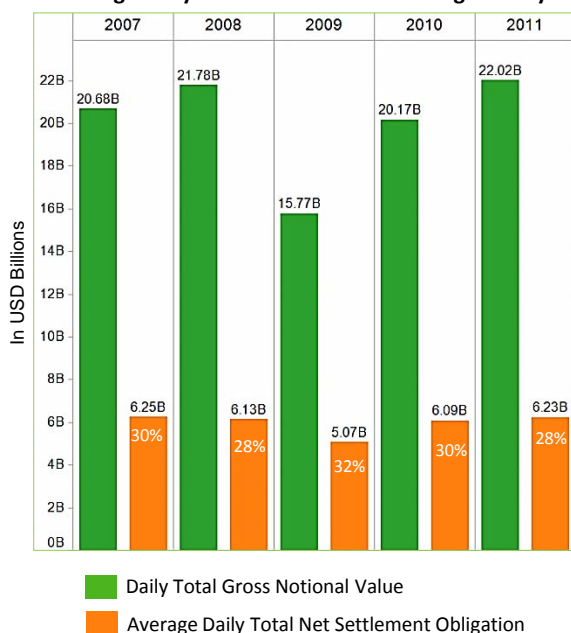
(One CCP – Calculations Based on Net Settlement Obligations)

Multilateral Netting Efficiencies of a CCP Interdealer Market

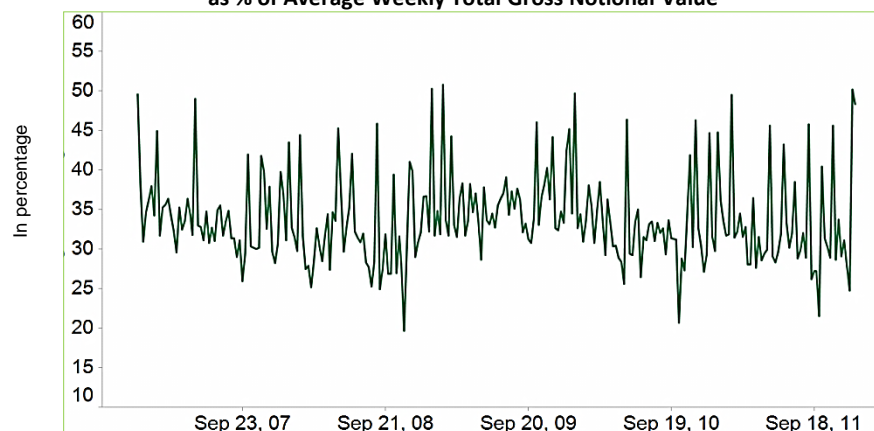
Below illustrates the power of multilateral netting used by a CCP to calculate the total settlement obligations due from all clearing firms.

- **Total Gross Notional Value** = sum of “sold” currency amounts for *all* valid trades, then *aggregated* across *all* clearing firms
- **Total Net Settlement Obligation** = sum of currency amounts payable to CCP, after netting “sold” amounts with “purchased” amounts for each currency for each firm converted to USD equivalent and then *aggregated* across *all* clearing firms

**Average Daily Total Gross Notional Value
vs. Average Daily Total Net Settlement Obligation by Year**



**Average Weekly Total Net Settlement Obligation
as % of Average Weekly Total Gross Notional Value**



Highest Payment Reduction Benefit (Single Day)				
	in USD equiv, billions			
	Total Net Settlement Obligation	Total Gross Notional Value	Net % of Gross	Payment Reduction Benefit
2007	12.46	81.97	15.20%	84.80%
2008	9.50	67.93	13.99%	86.01%
2009	9.90	59.18	16.73%	83.27%
2010	7.22	35.24	20.49%	79.51%
2011	8.39	75.03	11.19%	88.81%

Payment Reduction Benefit For Highest Total Gross Notional Amount (Single Day)				
	in USD equiv, billions			
	Total Net Settlement Obligation	Total Gross Notional Value	Net % of Gross	Payment Reduction Benefit
2007	12.46	81.97	15.20%	84.80%
2008	9.50	67.93	13.99%	86.01%
2009	9.90	59.18	16.73%	83.27%
2010	13.92	57.41	24.25%	75.75%
2011	21.55	100.62	21.42%	78.58%

- Transactional data collected from GFMA Global FX Division (GFXD) member firms (22) who represent 90% of FX dealer flow. Includes trades w/other GFXD firms (“inter-dealer” market), and non-GFXD firms (clients & other dealers)
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- Expiry date on or between Jan 2007 – Dec 2011

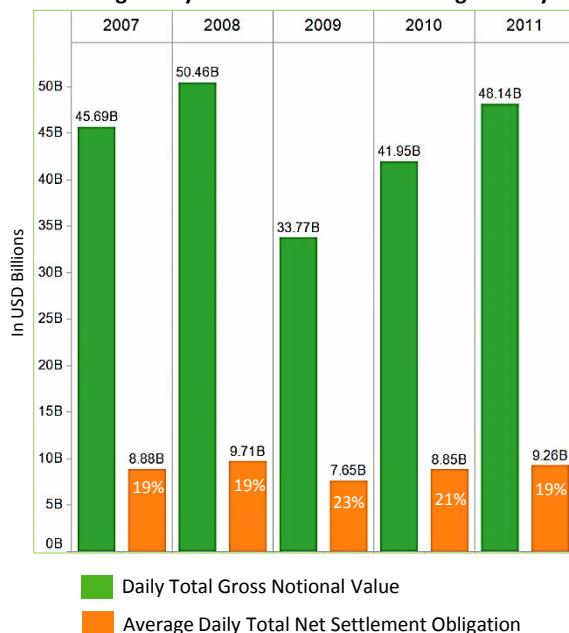
Multilateral Netting Efficiencies of a CCP

Interdealer Market with Client Clearing via *Single GFXD Member*

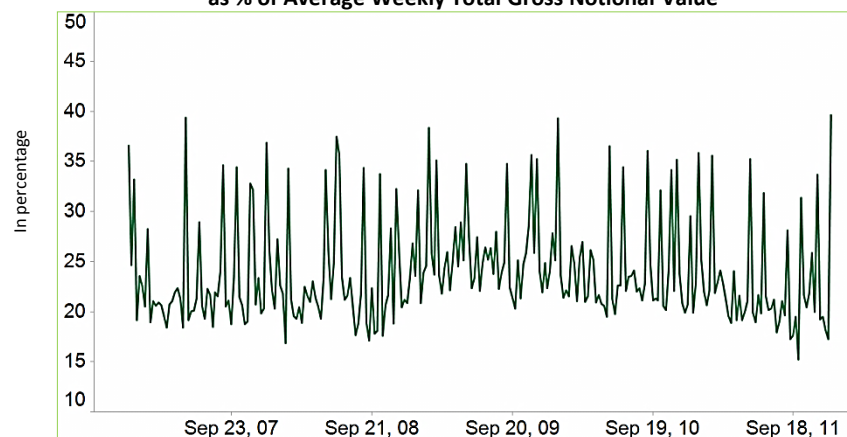
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**Average Daily Total Gross Notional Value
vs. Average Daily Total Net Settlement Obligation By Year**



**Average Weekly Total Net Settlement Obligation
as % of Average Weekly Total Gross Notional Value**



Highest Payment Reduction Benefit (Single Day)				
	in USD equiv, billions		Net % of Gross	Payment Reduction Benefit
	Total Net Settlement Obligation	Total Gross Notional Value		
2007	17.72	165.30	10.72%	89.28%
2008	9.31	87.38	10.66%	89.34%
2009	11.77	90.52	13.02%	86.98%
2010	13.63	104.82	13.00%	87.00%
2011	11.56	104.53	11.06%	88.94%

Payment Reduction Benefit For Highest Total Gross Notional Amount (Single Day)				
	in USD equiv, billions		Net % of Gross	Payment Reduction Benefit
	Total Net Settlement Obligation	Total Gross Notional Value		
2007	17.72	165.30	10.72%	89.28%
2008	22.81	168.61	13.53%	86.47%
2009	15.49	111.07	13.94%	86.06%
2010	17.32	109.63	15.80%	84.20%
2011	32.82	205.04	16.01%	83.99%

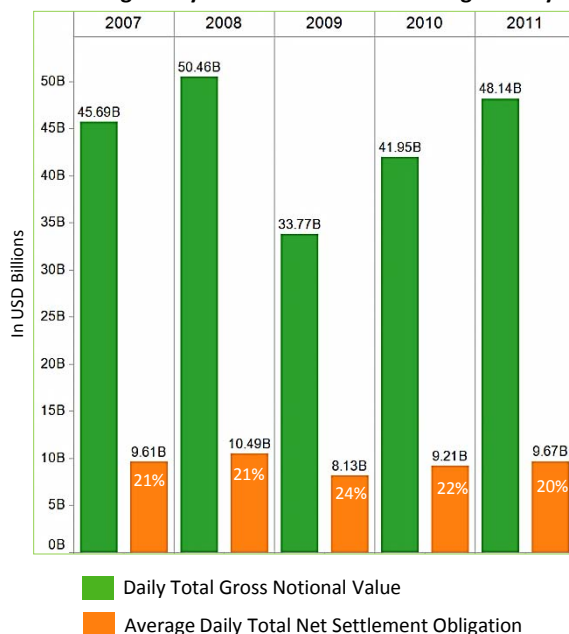
Multilateral Netting Efficiencies of a CCP

Interdealer Market with Client Clearing via *Several (5) GFXD Dealers*

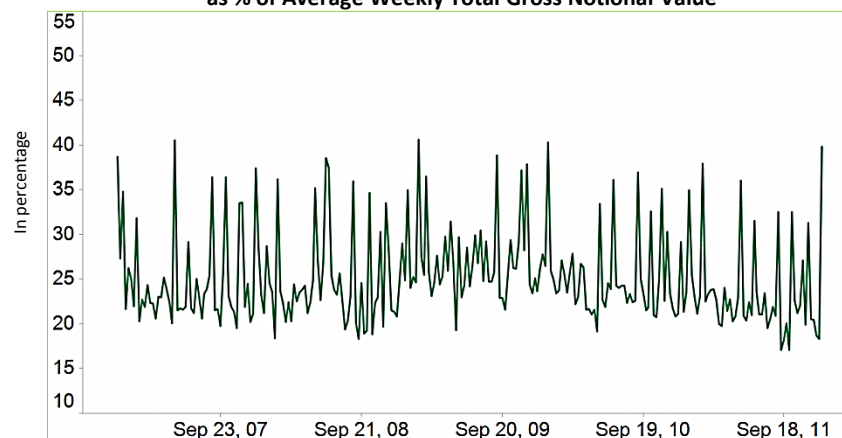
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**Average Daily Total Gross Notional Value
vs. Average Daily Total Net Settlement Obligation By Year**



**Average Weekly Total Net Settlement Obligation
as % of Average Weekly Total Gross Notional Value**



Highest Payment Reduction Benefit (Single Day)				
	in USD equiv, billions		Net % of Gross	Payment Reduction Benefit
	Total Net Settlement Obligation	Total Gross Notional Value		
2007	20.79	165.30	12.58%	87.42%
2008	10.08	87.39	11.53%	88.47%
2009	12.42	93.24	13.32%	86.68%
2010	14.59	105.31	13.86%	86.14%
2011	11.36	104.53	10.86%	89.14%

Payment Reduction Benefit For Highest Total Gross Notional Amount (Single Day)				
	in USD equiv, billions		Net % of Gross	Payment Reduction Benefit
	Total Net Settlement Obligation	Total Gross Notional Value		
2007	20.79	165.30	12.58%	87.42%
2008	25.56	168.61	15.16%	84.84%
2009	16.56	111.07	14.91%	85.09%
2010	18.33	109.63	16.72%	83.28%
2011	30.57	205.04	14.91%	85.09%

- Transactional data collected from GFMA Global FX Division (GFXD) member firms (22) who represent 90% of FX dealer flow. Includes trades w/other GFXD firms (“inter-dealer” market), and non-GFXD firms (clients & other dealers)
- OTC FX vanilla options, European style, executed on basis of physical settlement
- Expiry date on or between Jan 2007 – Dec 2011

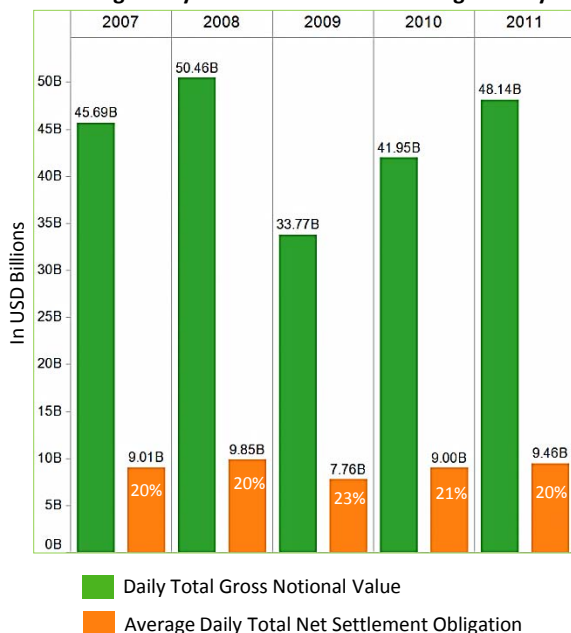
Multilateral Netting Efficiencies of a CCP

Interdealer Market with Client Clearing via *Single Non-GFXD Dealer*

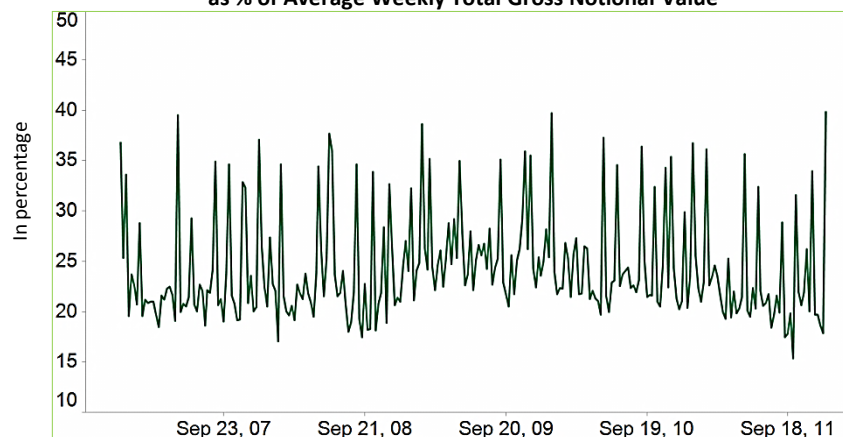
Below illustrates the power of multilateral netting used by a CCP to calculate the total settlement obligations due from all clearing firms.

- **Total Gross Notional Value** = sum of “sold” currency amounts for *all* valid trades, then *aggregated* across *all* clearing firms
- **Total Net Settlement Obligation** = sum of currency amounts payable to CCP, after netting “sold” amounts with “purchased” amounts for each currency for each firm, converted to USD equivalent and then *aggregated* across *all* clearing firms

**Average Daily Total Gross Notional Value
vs. Average Daily Total Net Settlement Obligation By Year**



**Average Weekly Total Net Settlement Obligation
as % of Average Weekly Total Gross Notional Value**



Highest Payment Reduction Benefit (Single Day)

	in USD equiv, billions		Net % of Gross	Payment Reduction Benefit
	Total Net Settlement Obligation	Total Gross Notional Value		
2007	17.78	165.30	10.75%	89.25%
2008	9.42	87.38	10.78%	89.22%
2009	12.11	90.52	13.38%	86.62%
2010	13.92	104.82	13.28%	86.72%
2011	11.73	104.53	11.22%	88.78%

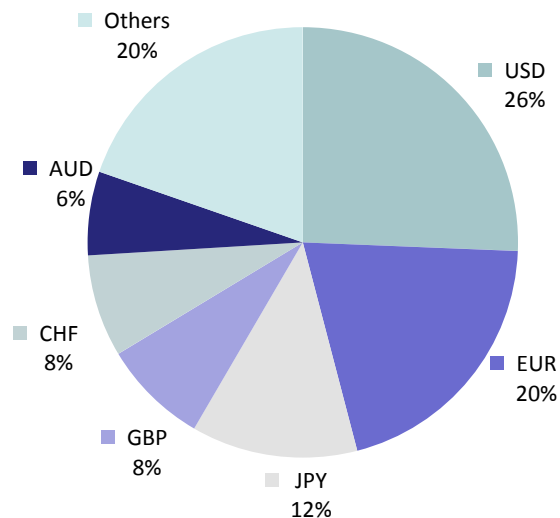
**Payment Reduction Benefit
For Highest Total Gross Notional Amount (Single Day)**

	in USD equiv, billions		Net % of Gross	Payment Reduction Benefit
	Total Net Settlement Obligation	Total Gross Notional Value		
2007	17.78	165.30	10.75%	89.25%
2008	22.92	168.61	13.59%	86.41%
2009	15.57	111.07	14.01%	85.99%
2010	17.60	109.63	16.06%	83.94%
2011	32.97	205.04	16.08%	83.92%

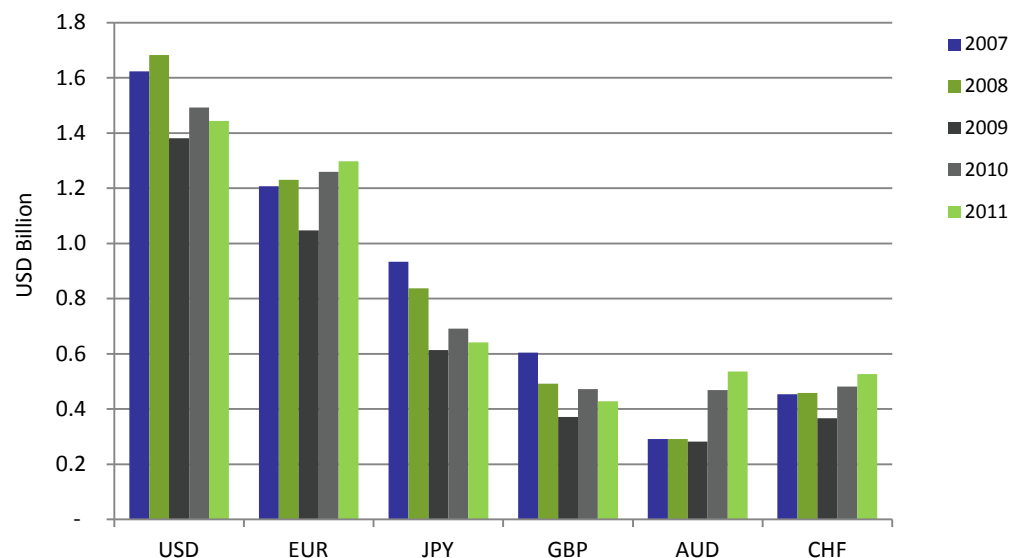
- Transactional data collected from GFMA Global FX Division (GFXD) member firms (22) who represent 90% of FX dealer flow. Includes trades w/other GFXD firms (“inter-dealer” market), and non-GFXD firms (clients & other dealers)
- OTC FX vanilla options, European style, executed on basis of physical settlement
- Expiry date on or between Jan 2007 – Dec 2011

Currencies Representing Largest Settlement Obligations – Interdealer Market

Currency Distribution of Net Settlement Obligations

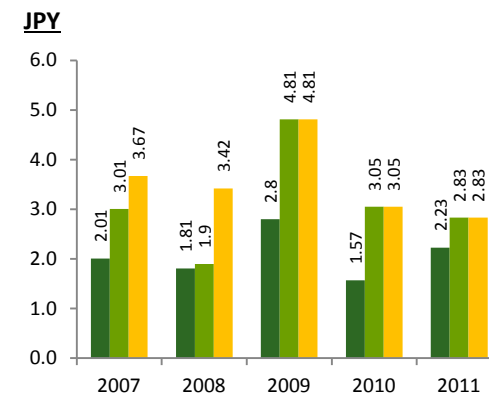
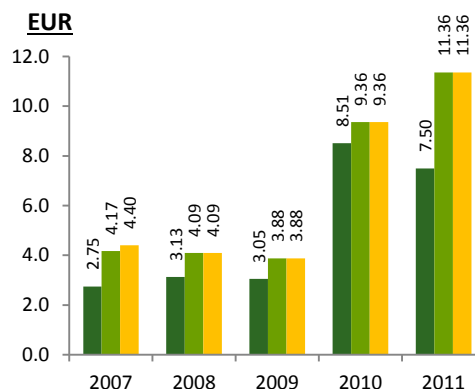
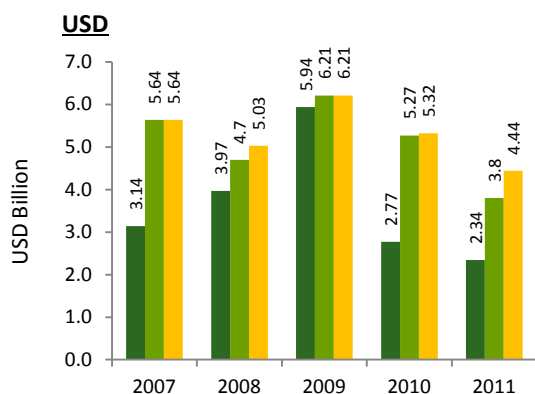


Average Net Settlement Obligations for Top 6 Currencies



Currency Specific Peaks (Top 6 Currencies) – Interdealer Market

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



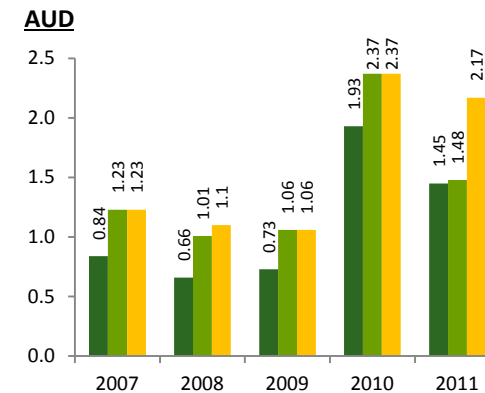
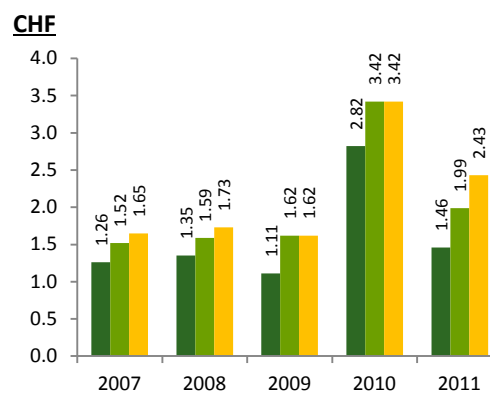
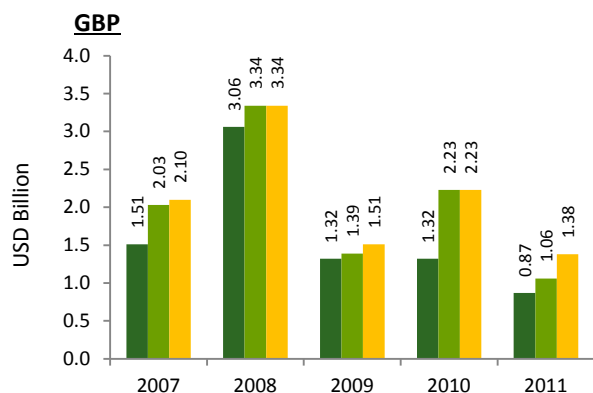
Largest single day	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	5.94	0.66	0.32	6.92
Date	1/23/2009	1/26/2009	1/27/2009	

Settlement date	Settlement date +1	Settlement date +2	3 day total
8.51	0.18	0.41	9.10
9/14/2010	9/15/2010	9/16/2010	

Settlement date	Settlement date +1	Settlement date +2	3 day total
2.80	0.28	0.15	3.23
1/23/2009	1/26/2009	1/27/2009	

Currency Specific Peaks (Top 6 Currencies) – Interdealer Market... *continued*

- largest combined net settlement obligation by two GFXD firms
- largest total net settlement obligation for all GFXD firms on that day
- largest total net settlement obligation for all GFXD firms for the year



Largest single day	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	3.06	0.15	0.03	3.24
Date	12/23/2008	12/24/2009	12/29/2008	

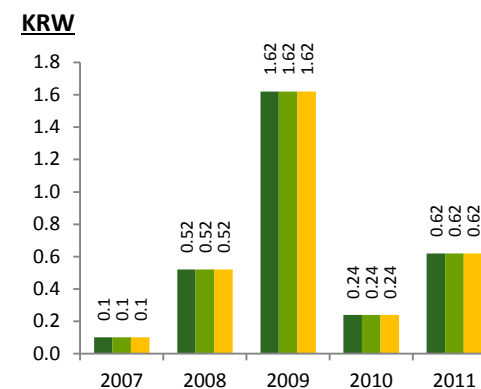
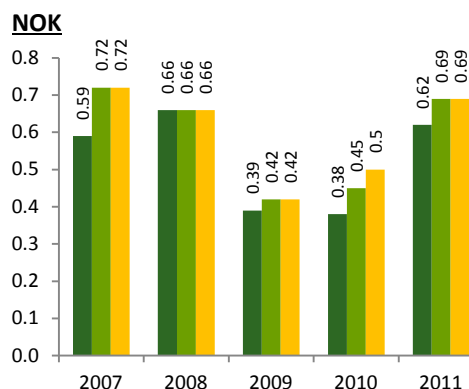
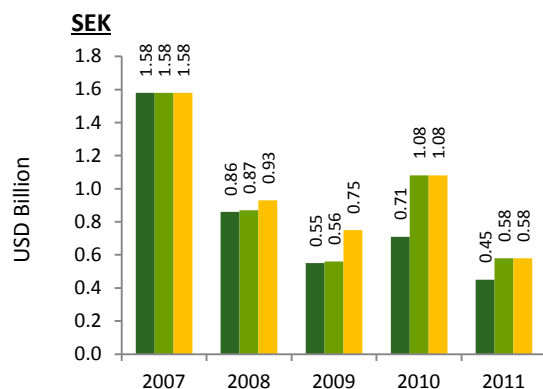
Settlement date	Settlement date +1	Settlement date +2	3 day total
2.82	0.03	0.17	3.02
7/6/2010	7/7/2010	7/8/2010	

Settlement date	Settlement date +1	Settlement date +2	3 day total
1.93	0.01	0.13	2.06
12/16/2010	12/17/2010	12/20/2010	

Currency Specific Peaks (Other CLS Currencies)

– Interdealer Market... *continued*

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



Largest single day	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	1.58	0.00	0.03	1.61
Date	6/19/2007	6/20/2007	6/21/2007	

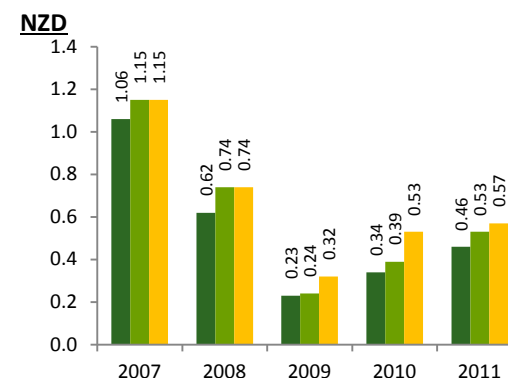
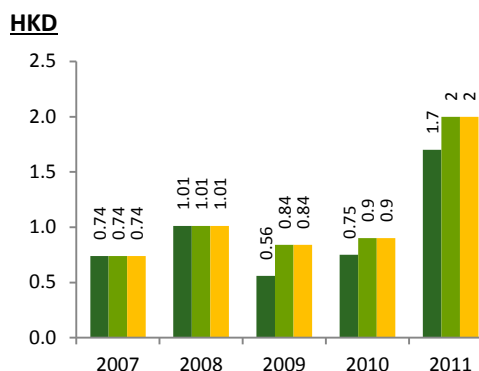
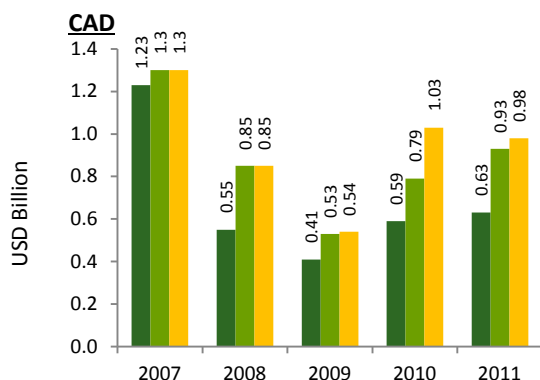
Settlement date	Settlement date +1	Settlement date +2	3 day total
0.66	0.00	0.00	0.66
5/14/2008	5/15/2008	5/16/2008	

Settlement date	Settlement date +1	Settlement date +2	3 day total
1.62	0.00	0.00	1.62
5/6/2009	5/7/2009	5/8/2009	

Currency Specific Peaks (Other CLS Currencies)

– Interdealer Market... *continued*

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



Largest single day	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	1.23	0.00	0.24	1.47
Date	9/24/2007	9/25/2007	9/26/2007	

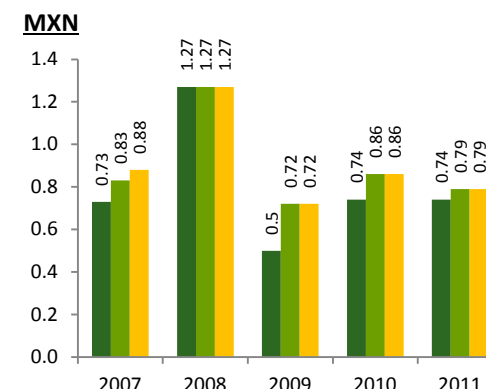
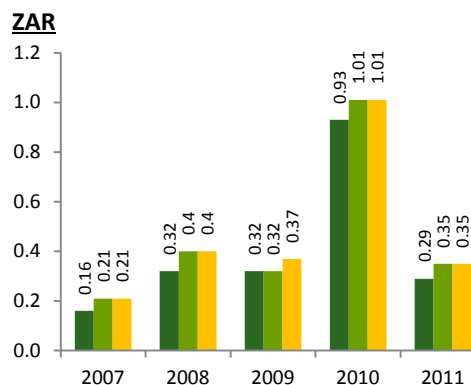
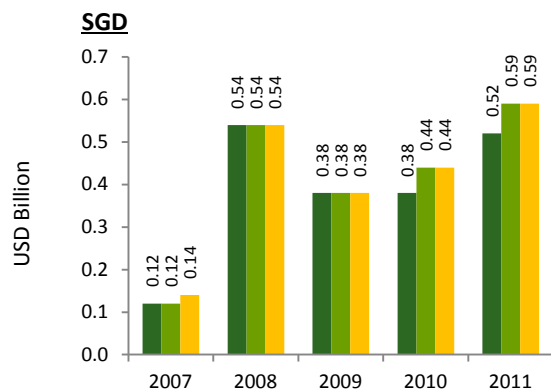
Settlement date	Settlement date +1	Settlement date +2	3 day total
1.70	0.00	0.00	1.70
1/11/2011	1/12/2011	1/13/2011	

Settlement date	Settlement date +1	Settlement date +2	3 day total
1.06	0.01	0.01	1.07
12/19/2007	12/20/2007	12/21/2007	

Currency Specific Peaks (Other CLS Currencies)

– Interdealer Market... *continued*

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



Largest single day	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	0.54	0.00	0.00	0.54
Date	3/14/2008	3/17/2008	3/18/2008	

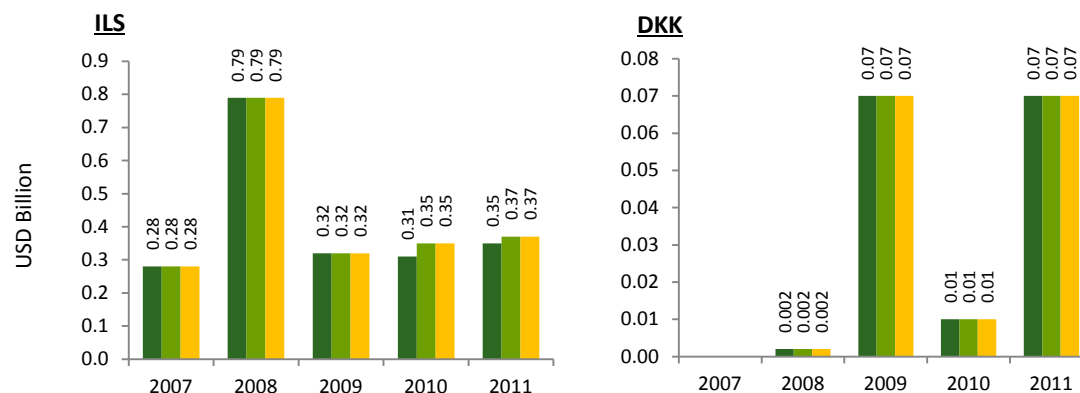
Settlement date	Settlement date +1	Settlement date +2	3 day total
0.93	0.02	0.00	0.95
6/11/2010	6/14/2010	6/15/2010	

Settlement date	Settlement date +1	Settlement date +2	3 day total
1.27	0.03	0.06	1.35
6/3/2008	6/4/2008	6/5/2008	

Currency Specific Peaks (Other CLS Currencies)

– Interdealer Market... *continued*

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*

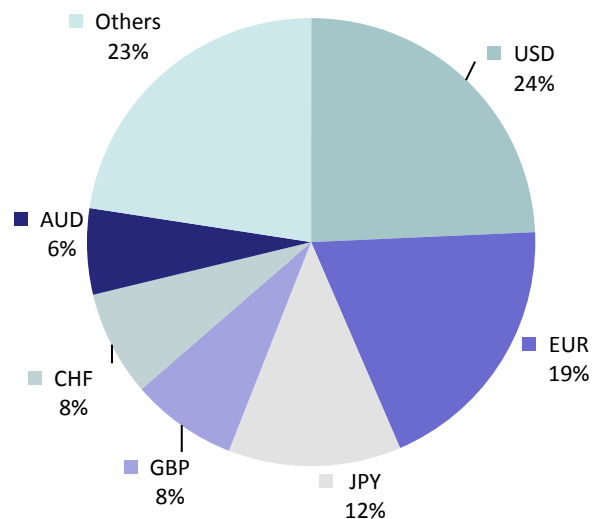


Largest single day	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	0.79	0.03	0.01	0.83
Date	5/15/2008	5/16/2008	5/19/2008	

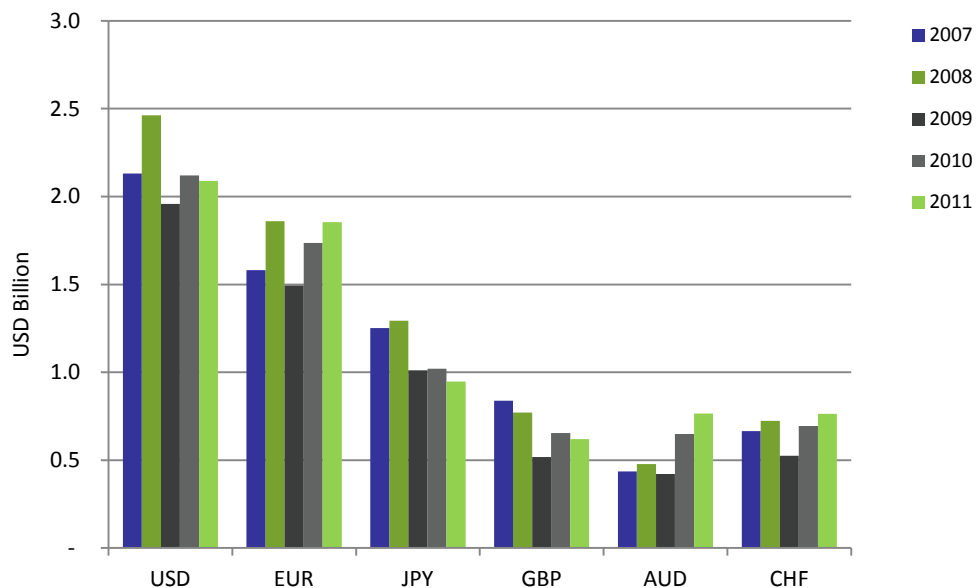
Settlement date	Settlement date +1	Settlement date +2	3 day total
0.07	0.00	0.00	0.07
10/9/2009	10/13/2009	10/14/2009	

Currencies Representing Largest Settlement Obligations – Interdealer Market with Client Clearing *via Single GFXD Firm*

Currency Distribution of Net Settlement Obligations



Average Net Settlement Obligations for Top 6 Currencies

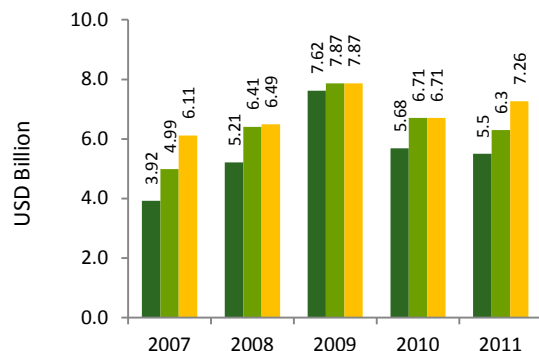


Currency Specific Peaks (Top 6 Currencies)

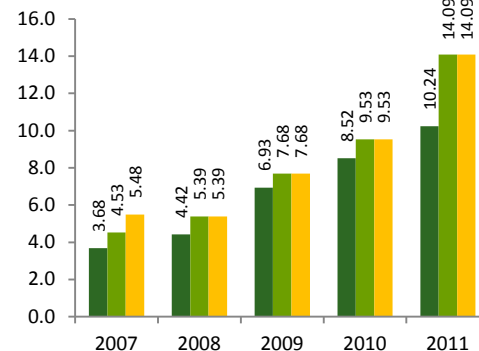
– Interdealer Market with Client Clearing via Single GFXD Firm

- largest combined net settlement obligation by two GFXD firms
- largest total net settlement obligation for all GFXD firms on that day
- largest total net settlement obligation for all GFXD firms for the year

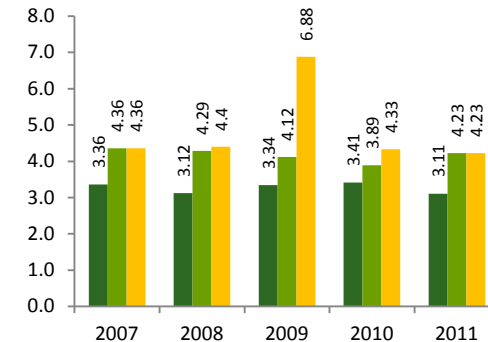
USD



EUR



JPY



Largest single day				
	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	7.62	1.25	0.37	9.24
Date	1/23/2009	1/26/2009	1/27/2009	
% attributable to client positions	22.01%	47.40%	13.07%	

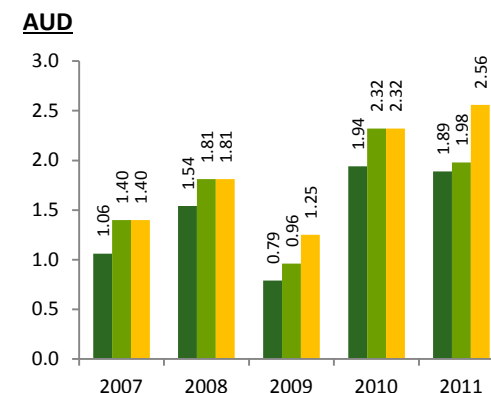
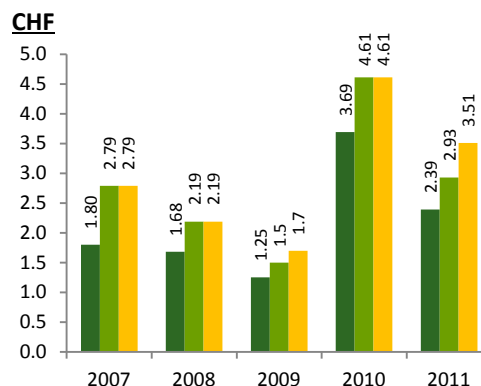
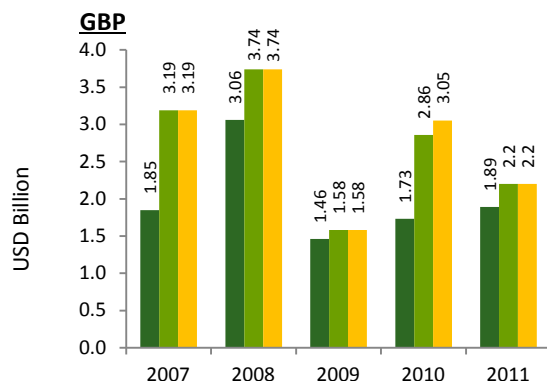
	Settlement date	Settlement date +1	Settlement date +2	3 day total
	10.24	1.01	0.77	12.02
	10/11/2011	10/12/2011	10/13/2011	
	26.82%	125.16%	122.97%	

	Settlement date	Settlement date +1	Settlement date +2	3 day total
	3.41	0.39	0.02	3.81
	01/12/2010	01/13/2010	01/14/2010	
	83.36%	75.49%	100.00%	

Currency Specific Peaks (Top 6 Currencies)

– Interdealer Market with Client Clearing via Single GFXD Firm... continued

- largest combined net settlement obligation by two GFXD firms
- largest total net settlement obligation for all GFXD firms on that day
- largest total net settlement obligation for all GFXD firms for the year



Largest single day	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	3.06	0.15	0.00	3.21
Date	12/23/2008	12/24/2008	12/26/2008	
% attributable to client positions	0.00%	8.80%	0.00%	

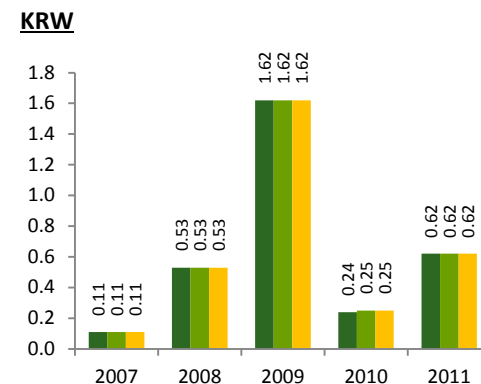
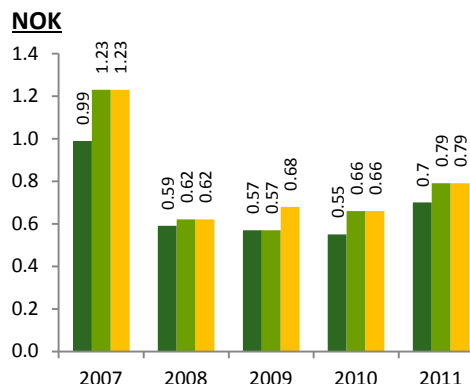
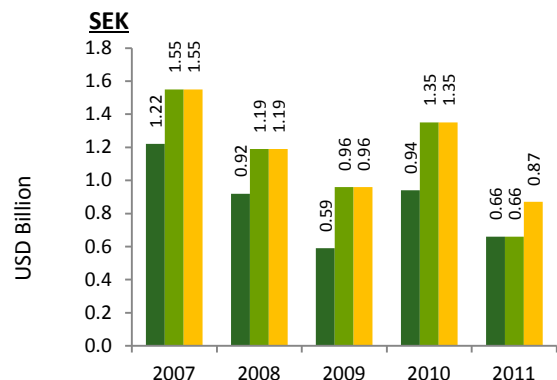
Settlement date	Settlement date +1	Settlement date +2	3 day total
3.69	0.14	0.75	4.58
7/6/2010	7/7/2010	7/8/2010	
25.14%	81.45%	33.63%	

Settlement date	Settlement date +1	Settlement date +2	3 day total
1.94	0.00	0.29	2.23
12/16/2010	12/17/2010	12/20/2010	
7.77%	0.00%	56.81%	

Currency Specific Peaks (Other CLS Currencies)

– Interdealer Market with Client Clearing via Single GFXD Firm... continued

- largest combined net settlement obligation by two GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



Largest single day	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	1.22	0.00	0.09	1.31
Date	6/19/2007	6/20/2007	6/21/2007	
% attributable to client positions	48.77%	0.00%	82.72%	

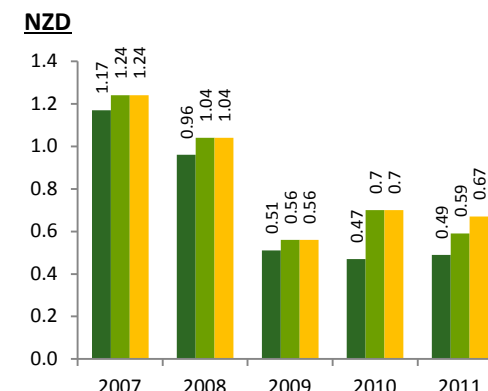
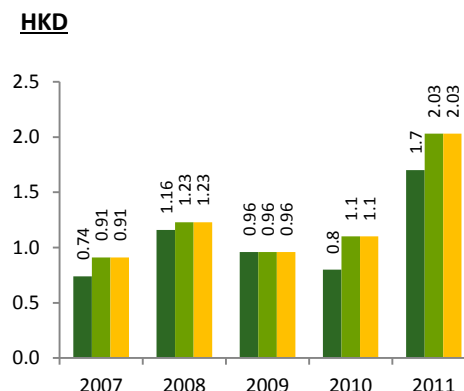
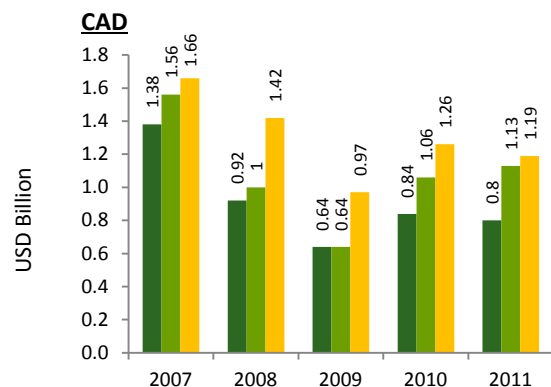
Settlement date	Settlement date +1	Settlement date +2	3 day total
0.99	0.00	0.00	0.99
11/13/2007	11/14/2007	11/15/2007	
62.76%	0.00%	0.00%	

Settlement date	Settlement date +1	Settlement date +2	3 day total
1.62	0.00	0.00	1.62
5/6/2009	5/7/2009	5/8/2009	
0.00%	0.00%	0.00%	

Currency Specific Peaks (Other CLS Currencies)

– Interdealer Market with Client Clearing via Single GFXD Firm... continued

- largest combined net settlement obligation by two GFXD firms
- largest total net settlement obligation for all GFXD firms on that day
- largest total net settlement obligation for all GFXD firms for the year



Largest single day	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	1.38	0.00	0.23	1.61
Date	9/24/2007	9/25/2007	9/26/2007	
% attributable to client positions	19.43%	0.00%	0.34%	

Settlement date	Settlement date +1	Settlement date +2	3 day total
1.70	0.00	0.00	1.70
1/11/2011	1/12/2011	1/13/2011	
0.00%	0.00%	0.00%	

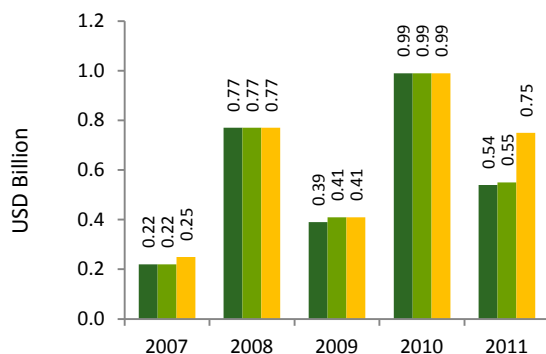
Settlement date	Settlement date +1	Settlement date +2	3 day total
1.17	0.10	0.00	1.27
12/19/2007	12/20/2007	12/21/2007	
11.16%	88.33%	0.00%	

Currency Specific Peaks (Other CLS Currencies)

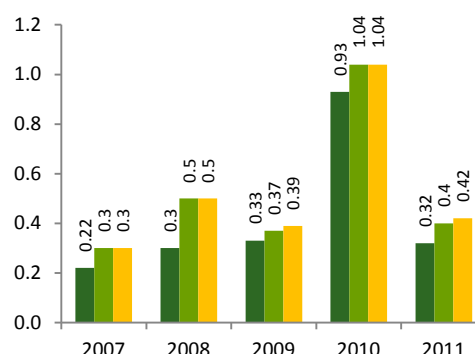
– Interdealer Market with Client Clearing via Single GFXD Firm... continued

- largest combined net settlement obligation by two GFXD firms
- largest total net settlement obligation for all GFXD firms on that day
- largest total net settlement obligation for all GFXD firms for the year

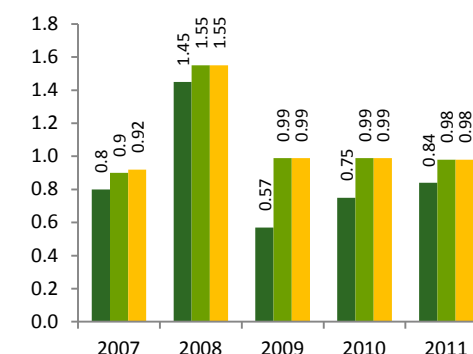
SGD



ZAR



MXN



Largest single day	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	0.99	0.38	0.00	1.36
Date	7/28/2010	7/29/2010	7/30/2010	
% attributable to client positions	98.98%	38.66%	0.00%	

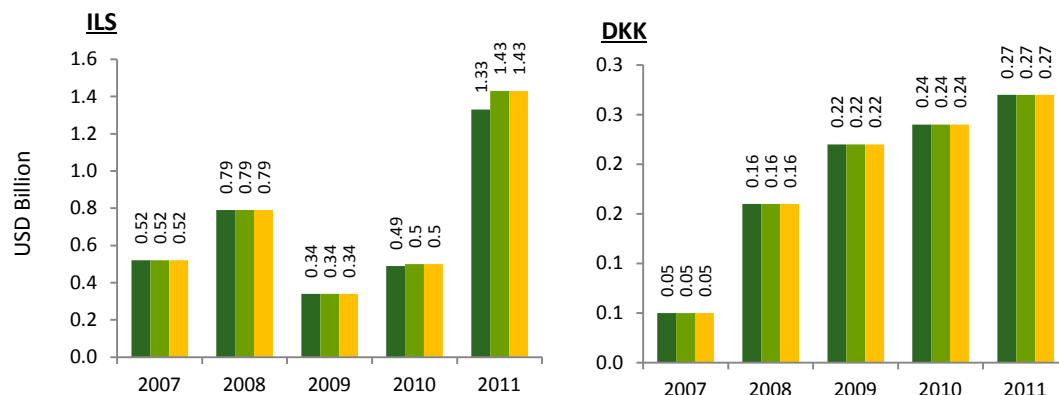
Settlement date	Settlement date +1	Settlement date +2	3 day total
0.93	0.02	0.00	0.96
6/11/2010	6/14/2010	6/15/2010	
0.00%	19.79%	0.00%	

Settlement date	Settlement date +1	Settlement date +2	3 day total
1.45	0.03	0.02	1.50
6/3/2008	6/4/2008	6/5/2008	
35.53%	100.00%	0.00%	

Currency Specific Peaks (Other CLS Currencies)

– Interdealer Market with Client Clearing via Single GFXD Firm... continued

- largest combined net settlement obligation by two GFXD firms
- largest total net settlement obligation for all GFXD firms on that day
- largest total net settlement obligation for all GFXD firms for the year



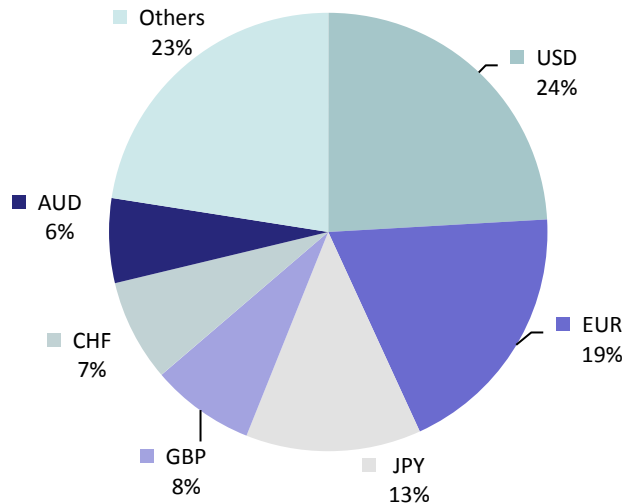
Largest single day	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	1.33	0.12	0.02	1.47
Date	6/23/2011	6/24/2011	6/27/2011	
% attributable to client positions	96.30%	100.00%	100.00%	

Settlement date	Settlement date +1	Settlement date +2	3 day total
0.27	0.00	0.00	0.27
1/31/2011	2/1/2011	2/2/2011	
100.00%	0.00%	0.00%	

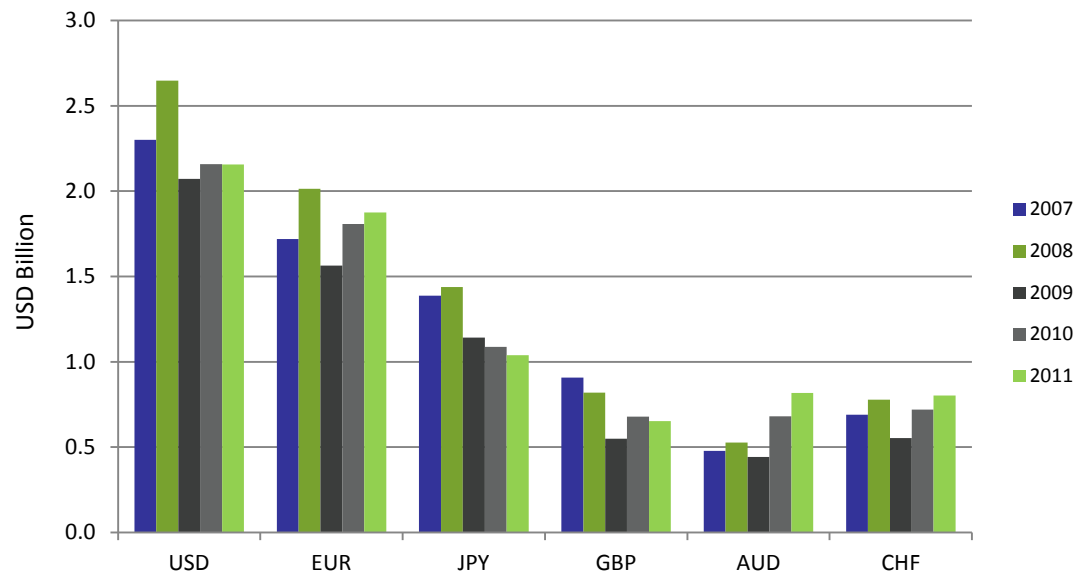
Currencies Representing Largest Funding Obligations

– Interdealer Market with Client Clearing *via Several (5) GFXD Firms*

Currency Distribution of Pay-In Amounts



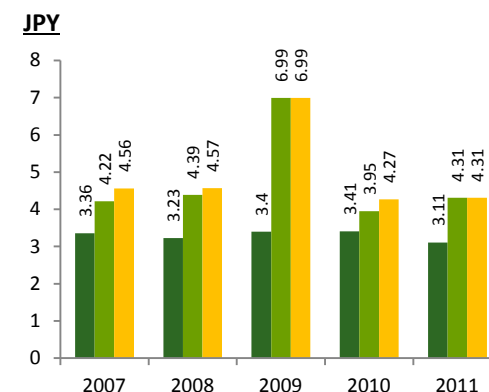
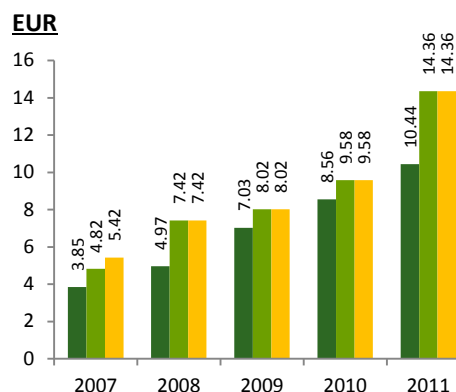
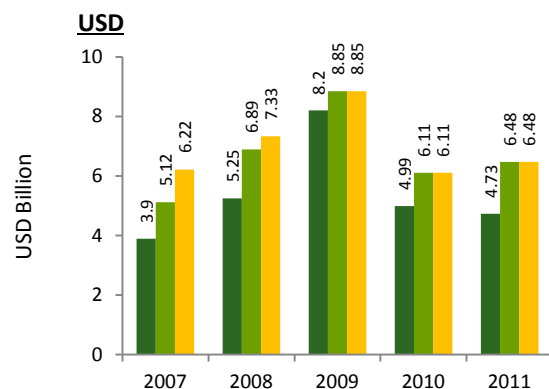
Average Net Pay In Amount for Top 6 Currencies



Currency Specific Peaks (Top 6 Currencies)

– Interdealer Market with Client Clearing *via Several (5) GFXD Firms*

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



Largest single day	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	8.20	1.19	0.57	9.95
Date	1/23/2009	1/26/2009	1/27/2009	
% attributable to client positions	27.51%	44.75%	43.63%	

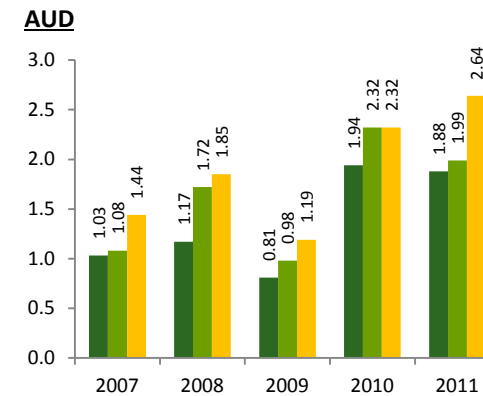
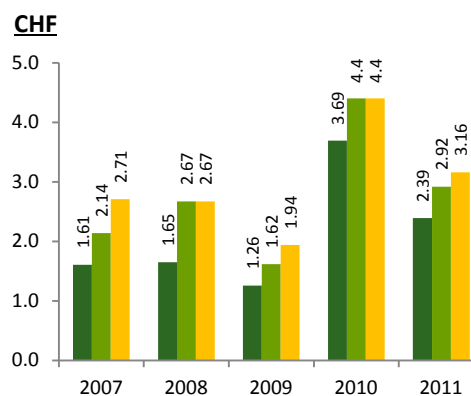
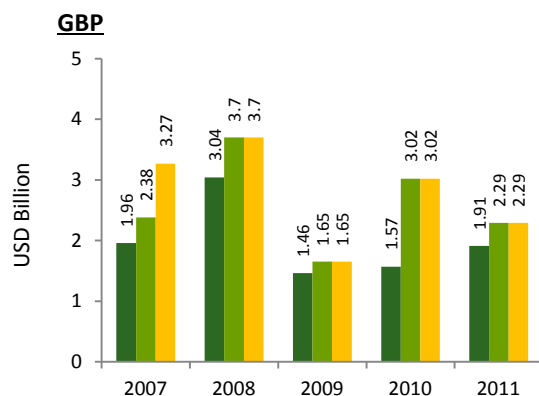
Settlement date	Settlement date +1	Settlement date +2	3 day total
10.44	1.01	0.77	12.23
10/11/2011	10/12/2011	10/13/2011	
28.23%	129.94%	125.26%	

Settlement date	Settlement date +1	Settlement date +2	3 day total
3.41	0.39	0.02	3.81
1/12/2010	1/13/2010	1/14/2010	
83.36%	75.49%	100.00%	

Currency Specific Peaks (Top 6 Currencies)

– Interdealer Market with Client Clearing *via Several (5) GFXD Firms... continued*

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



Largest single day				
	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	3.04	0.10	0.16	3.30
Date	12/23/2008	12/24/2008	12/29/2008	
% attributable to client positions	0.00%	12.44%	82.44%	

	Settlement date	Settlement date +1	Settlement date +2	3 day total
	3.69	0.14	0.75	4.58
	7/6/2010	7/7/2010	7/8/2010	
	25.14%	81.45%	33.63%	

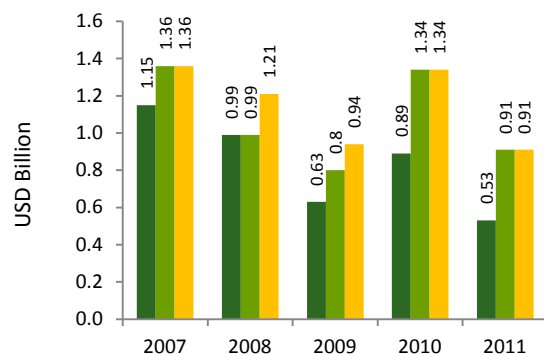
	Settlement date	Settlement date +1	Settlement date +2	3 day total
	1.94	0.00	0.29	2.23
	12/16/2010	12/17/2010	12/20/2010	
	7.77%	0.00%	56.81%	

Currency Specific Peaks (Other CLS Currencies)

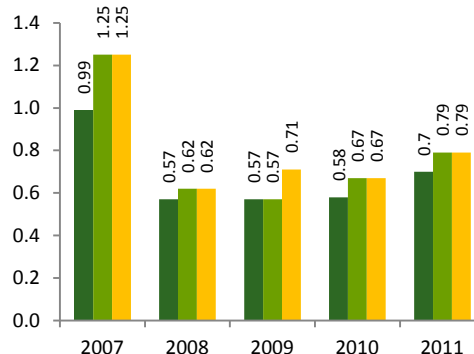
– Interdealer Market with Client Clearing *via Several (5) GFXD Firms... continued*

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*

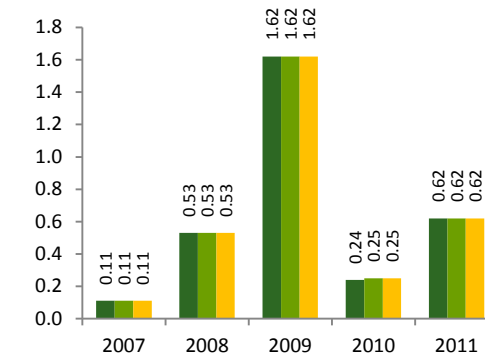
SEK



NOK



KRW



Largest single day				
Billion USD equivalent	Settlement date	Settlement date +1	Settlement date +2	3 day total
Date	6/19/2007	6/20/2007	6/21/2007	
% attributable to client positions	131.83%	0.00%	0.00%	

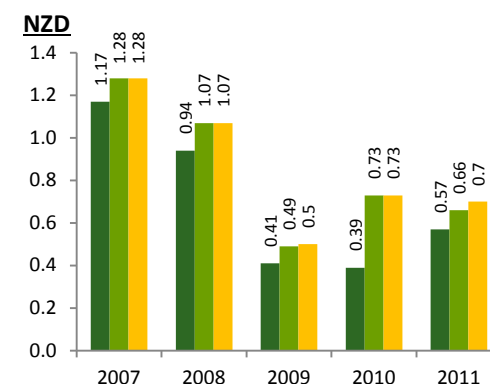
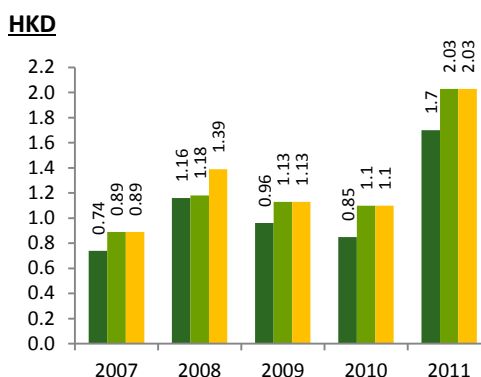
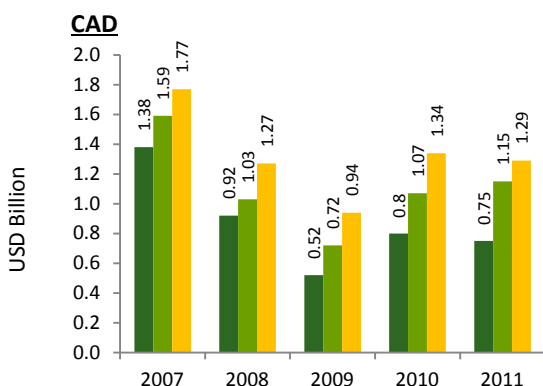
Settlement date	Settlement date +1	Settlement date +2	3 day total
0.99	0.00	0.00	0.99
11/13/2007	11/14/2007	11/15/2007	
62.76%	0.00%	0.00%	

Settlement date	Settlement date +1	Settlement date +2	3 day total
1.62	0.00	0.00	1.62
5/6/2009	5/7/2009	5/8/2009	
0.00%	0.00%	0.00%	

Currency Specific Peaks (Other CLS Currencies)

– Interdealer Market with Client Clearing *via Several (5) GFXD Firms... continued*

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



Largest single day				
	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	1.38	0.00	0.23	1.61
Date	9/24/2007	9/25/2007	9/26/2007	
% attributable to client positions	19.43%	0.00%	0.34%	

	Settlement date	Settlement date +1	Settlement date +2	3 day total
	1.70	0.00	0.01	1.71
	1/11/2011	1/12/2011	1/13/2011	
	0.00%	100.00%	100.00%	

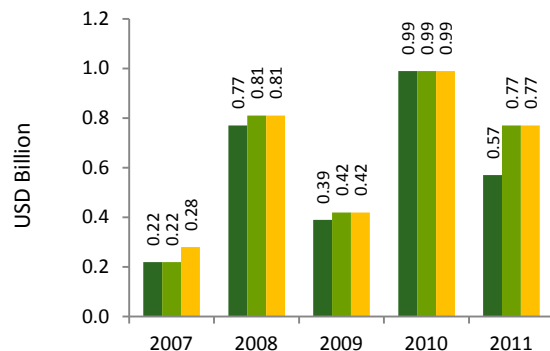
	Settlement date	Settlement date +1	Settlement date +2	3 day total
	1.17	0.10	0.00	1.27
	12/19/2007	12/20/2007	12/21/2007	
	11.16%	88.33%	0.00%	

Currency Specific Peaks (Other CLS Currencies)

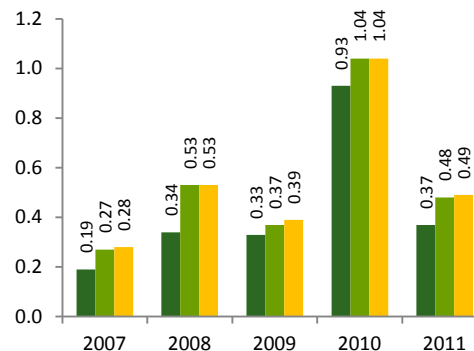
– Interdealer Market with Client Clearing *via Several (5) GFXD Firms... continued*

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*

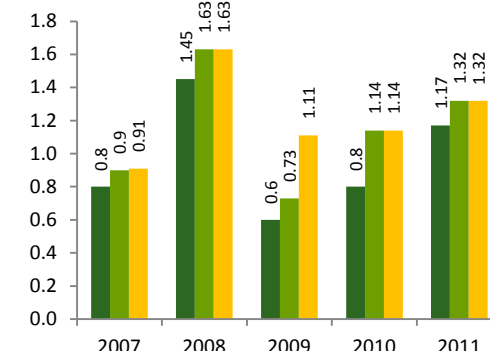
SGD



ZAR



MXN



Largest single day	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	0.99	0.38	0.00	1.36
Date	7/28/2010	7/29/2010	7/30/2010	
% attributable to client positions	98.98%	38.66%	0.00%	

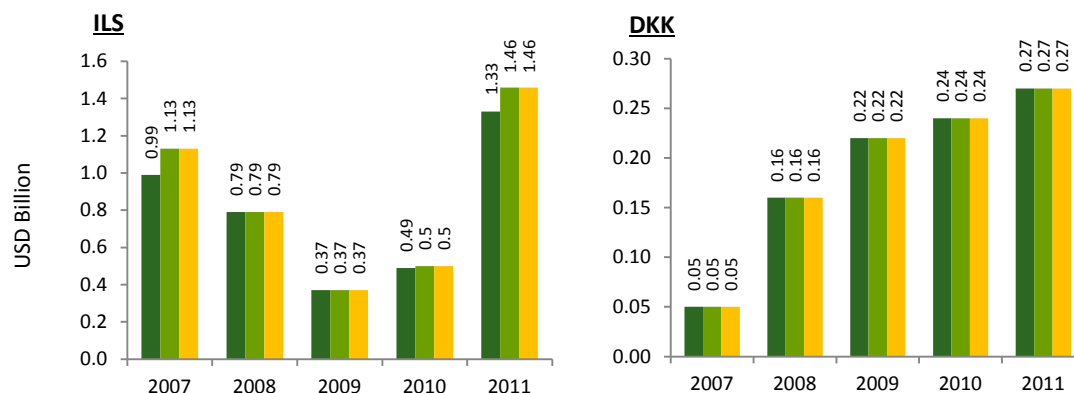
Settlement date	Settlement date +1	Settlement date +2	3 day total
0.93	0.03	0.01	0.97
6/11/2010	6/14/2010	6/15/2010	
0.00%	31.01%	100.00%	

Settlement date	Settlement date +1	Settlement date +2	3 day total
1.45	0.03	0.02	1.50
6/3/2008	6/4/2008	6/5/2008	
35.53%	100.00%	0.00%	

Currency Specific Peaks (Other CLS Currencies)

– Interdealer Market with Client Clearing *via Several (5) GFXD Firms... continued*

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



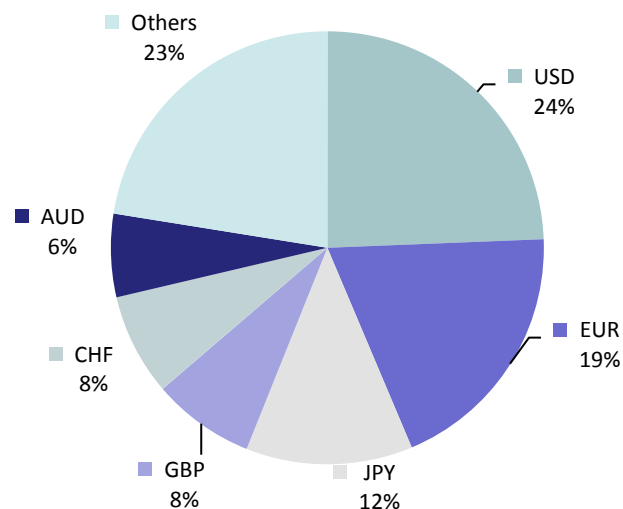
Largest single day				
	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	1.33	0.02	0.00	1.35
Date	6/23/2011	6/24/2011	6/27/2011	
% attributable to client positions	98.55%	100.00%	0.00%	

	Settlement date	Settlement date +1	Settlement date +2	3 day total
	0.27	0.00	0.00	0.27
Date	1/31/2011	2/1/2011	2/2/2011	
	100.00%	0.00%	0.00%	

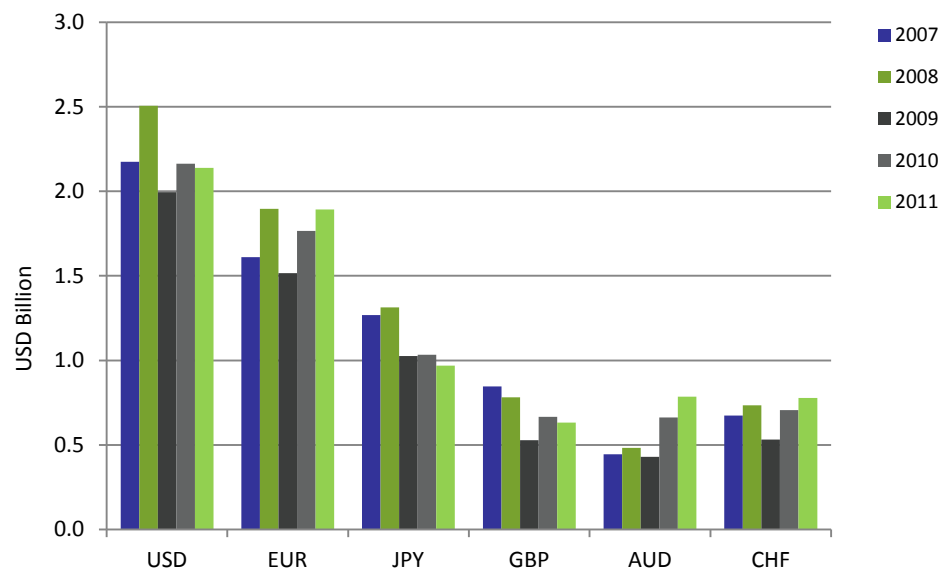
Currencies Representing Largest Settlement Obligations

– Interdealer Market with Client Clearing *via Single Non GFXD Firm*

Currency Distribution of Net Settlement Obligations



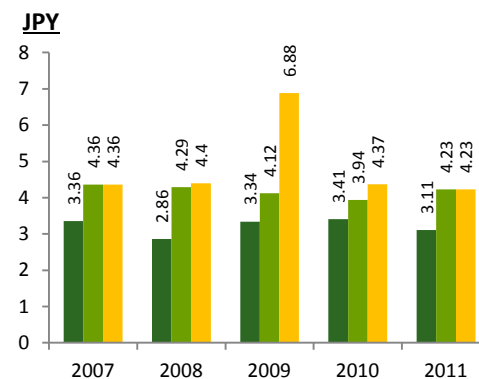
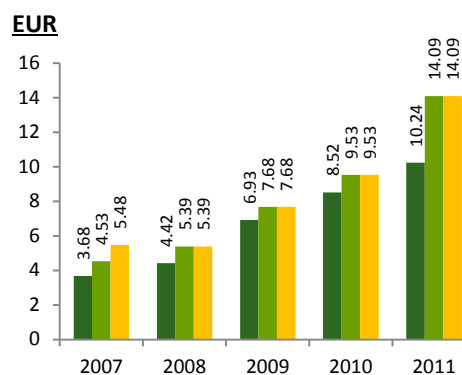
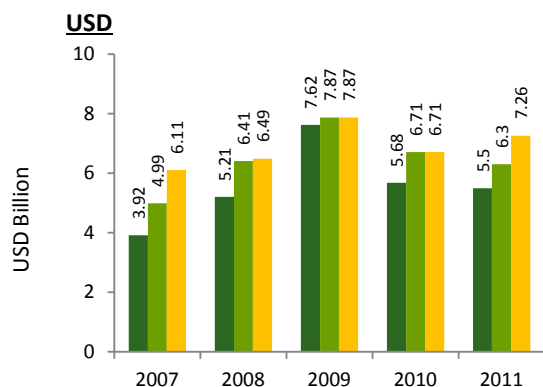
Average Net Settlement Obligations for Top 6 Currencies



Currency Specific Peaks (Top 6 Currencies)

– Interdealer Market with *Client Clearing via Single Non-GFXD Firm*

- largest combined net settlement obligation by two GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



Largest single day				
Billion USD equivalent	Settlement date	Settlement date +1	Settlement date +2	3 day total
Date	1/23/2009	1/26/2009	1/27/2009	
% attributable to client positions	22.01%	47.40%	13.07%	9.24

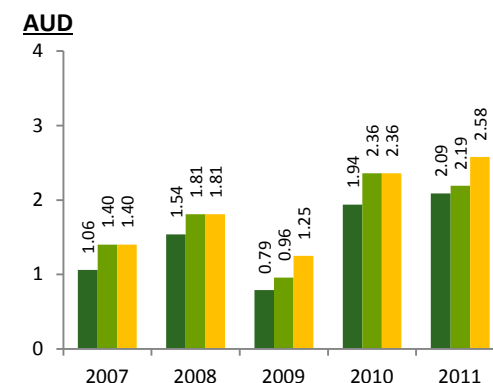
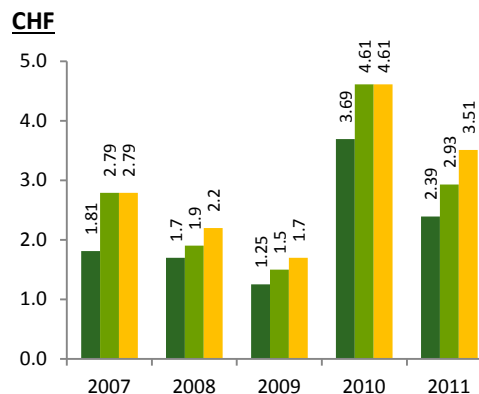
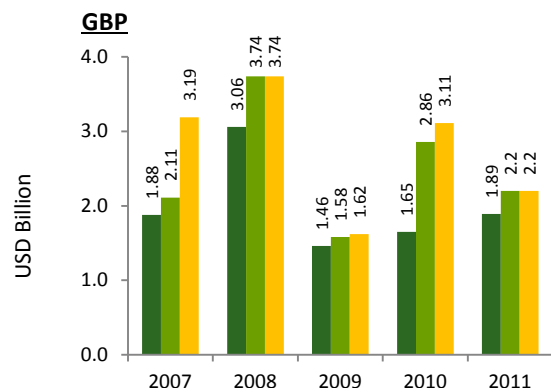
Settlement date	Settlement date +1	Settlement date +2	3 day total
10.24	1.01	0.77	12.02
10/11/2011	10/12/2011	10/13/2011	
26.82%	125.16%	122.97%	

Settlement date	Settlement date +1	Settlement date +2	3 day total
3.41	0.39	0.02	3.81
1/12/2010	1/13/2010	1/14/2010	
83.36%	75.49%	100.00%	

Currency Specific Peaks (Top 6 Currencies)

– Interdealer Market with *Client Clearing via Single Non-GFXD Firm... continued*

- largest combined net settlement obligation by two GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



Largest single day				
	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	3.06	0.15	0.16	3.37
Date	12/23/2008	12/24/2008	12/29/2008	
% attributable to client positions	0.00%	8.80%	82.44%	

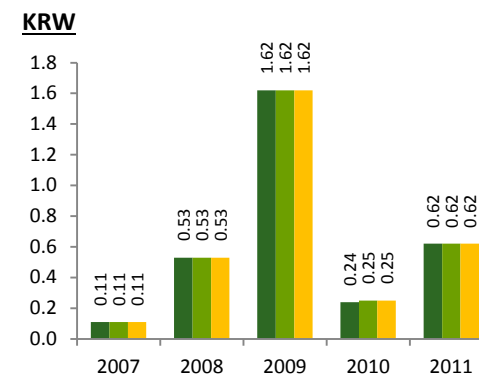
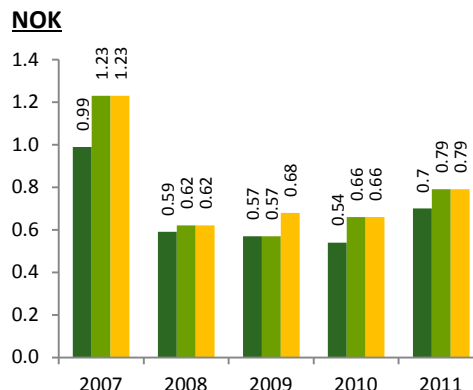
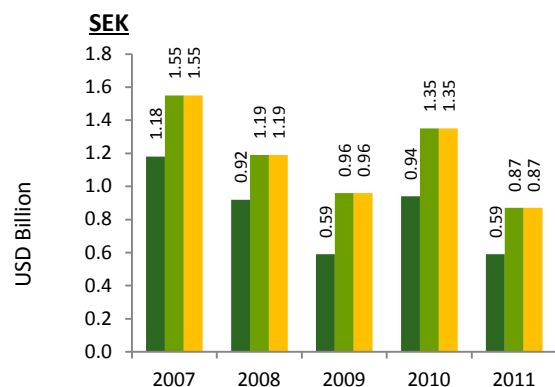
	Settlement date	Settlement date +1	Settlement date +2	3 day total
	3.69	0.14	0.75	4.58
	7/6/2010	7/7/2010	7/8/2010	
	25.14%	81.45%	33.63%	

	Settlement date	Settlement date +1	Settlement date +2	3 day total
	2.09	0.14	0.05	2.29
	11/29/2011	11/30/2011	12/1/2011	
	14.16%	0.00%	98.63%	

Currency Specific Peaks (Other CLS Currencies)

– Interdealer Market with *Client Clearing via Single Non-GFXD Firm... continued*

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



Largest single day				
	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	1.18	0.00	0.09	1.27
Date	6/19/2007	6/20/2007	6/21/2007	
% attributable to client positions	50.38%	0.00%	0.00%	

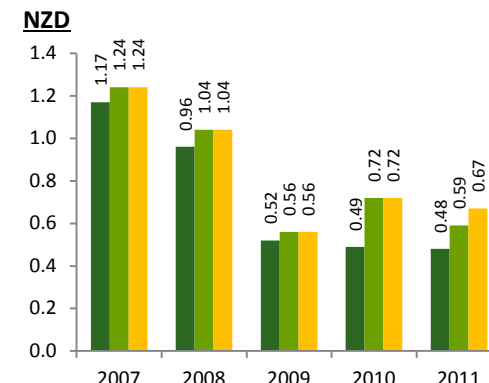
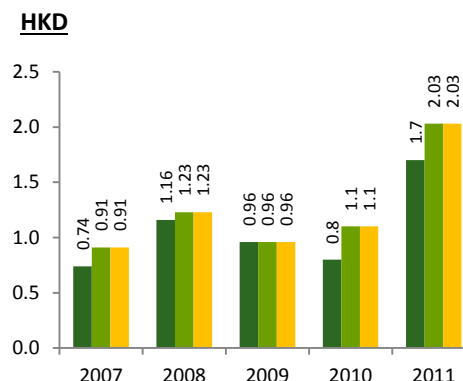
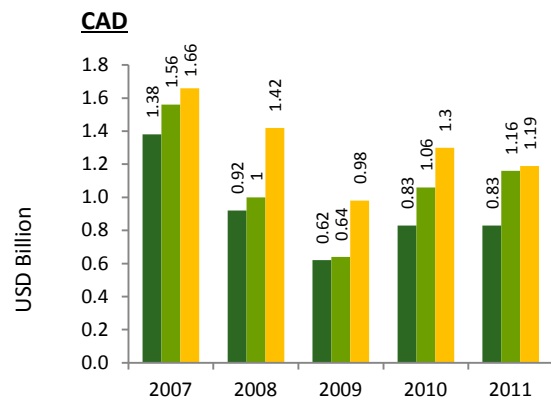
	Settlement date	Settlement date +1	Settlement date +2	3 day total
	0.99	0.00	0.00	0.99
	11/13/2007	11/14/2007	11/15/2007	
	62.76%	0.00%	0.00%	

	Settlement date	Settlement date +1	Settlement date +2	3 day total
	1.62	0.00	0.00	1.62
	5/6/2009	5/7/2009	5/8/2009	
	0.00%	0.00%	0.00%	

Currency Specific Peaks (Other CLS Currencies)

– Interdealer Market with *Client Clearing via Single Non-GFXD Firm... continued*

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



Largest single day				
Billion USD equivalent	Settlement date	Settlement date +1	Settlement date +2	3 day total
Date	9/24/2007	9/25/2007	9/26/2007	
% attributable to client positions	19.43%	0.00%	0.34%	

Settlement date	Settlement date +1	Settlement date +2	3 day total
1.70	0.00	0.00	1.70
1/11/2011	1/12/2011	1/13/2011	
0.00%	0.00%	0.00%	

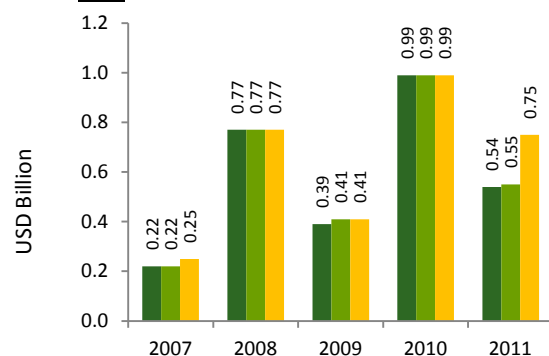
Settlement date	Settlement date +1	Settlement date +2	3 day total
1.17	0.10	0.00	1.27
12/19/2007	12/20/2007	12/21/2007	
11.16%	88.33%	0.00%	

Currency Specific Peaks (Other CLS Currencies)

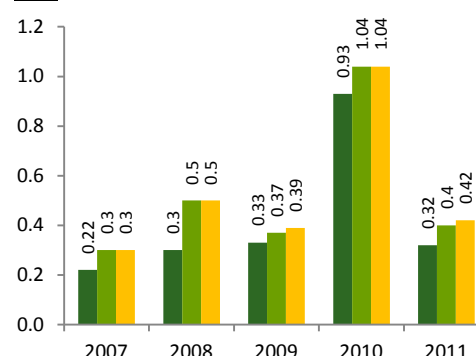
– Interdealer Market with *Client Clearing via Single Non-GFXD Firm... continued*

- largest combined net settlement obligation by *two* GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*

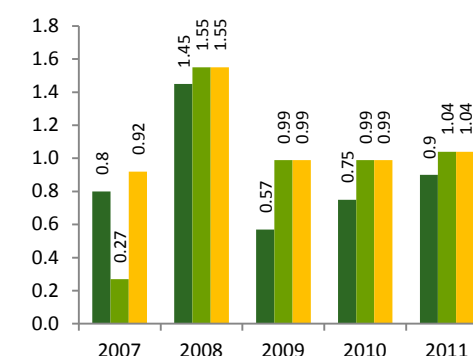
SGD



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MXN



Largest single day				
	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	0.99	0.38	0.00	1.36
Date	7/28/2010	7/29/2010	7/30/2010	
% attributable to client positions	98.98%	38.66%	0.00%	

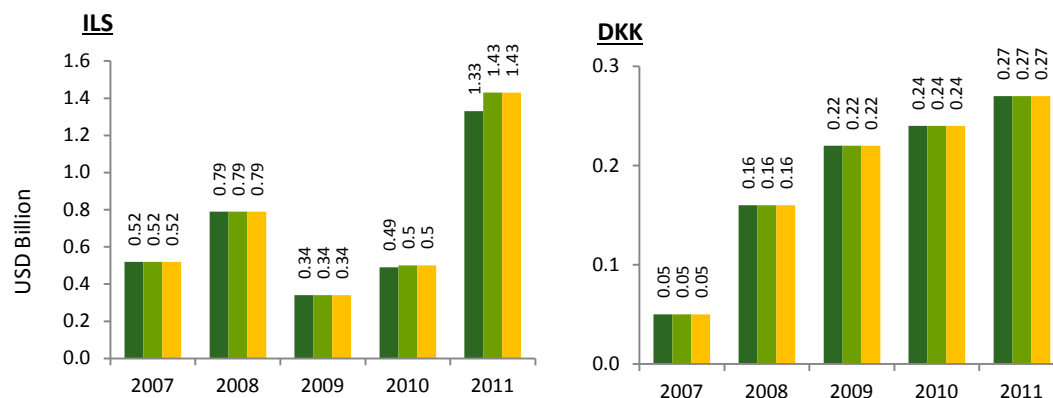
	Settlement date	Settlement date +1	Settlement date +2	3 day total
	0.93	0.02	0.00	0.96
	6/11/2010	6/14/2010	6/15/2010	
	0.00%	19.79%	0.00%	

	Settlement date	Settlement date +1	Settlement date +2	3 day total
	1.45	0.03	0.02	1.50
	6/3/2008	6/4/2008	6/5/2008	
	35.53%	100.00%	0.00%	

Currency Specific Peaks (Other CLS Currencies)

– Interdealer Market with *Client Clearing via Single Non-GFXD Firm... continued*

- largest combined net settlement obligation by two GFXD firms
- largest total net settlement obligation for *all* GFXD firms *on that day*
- largest total net settlement obligation for *all* GFXD firms *for the year*



Largest single day				
	Settlement date	Settlement date +1	Settlement date +2	3 day total
Billion USD equivalent	1.33	0.12	0.02	1.47
Date	6/23/2011	6/24/2011	6/27/2011	
% attributable to client positions	0.00%	0.00%	0.00%	

	Settlement date	Settlement date +1	Settlement date +2	3 day total
	0.27	0.00	0.00	0.27
Date	1/31/2011	2/1/2011	2/2/2011	
	100.00%	0.00%	0.00%	

End