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International Swaps and Derivatives Association, Inc.

Atrevida Partners, LLC

Interest Rate Swap Liquidity Test

A Report Sponsored by the
International Swaps and Derivatives Association (ISDA)

Conducted by Atrevida Partners, LLC

in conjunction with Market Participants

November 2010

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Summary

This report summarizes the results of an interest rate swap test ("IRS Test") sponsored by the International Swaps and Derivatives Association ("ISDA") and conducted by Atrevida Partners, LLC ("Atrevida"). The purpose of the IRS Test was to observe and determine the liquidity, price transparency and competitiveness of the "plain vanilla" US Dollar and Euro swap markets.

In the Test, which was conducted during the last two weeks of September 2010, three large investment firms each solicited price quotes from dealer firms on five separate IRS transactions. None of the 15 trades was exactly alike. The dealers were selected from amongst the 14 largest derivatives dealers. A total of 10 such firms was ultimately asked to provide quotes; none knew that the IRS Test was being conducted.

The dealer quotes were then compared against each other, and to Bloomberg page IRSB, to measure and benchmark their competitiveness and the market's liquidity and transparency. According to the IRS Test's results:

- The difference in pricing between the best and worst quotes for any swap ranged from 0.0000% to 0.013% (1.3 basis points). The average difference between the best and worst quotes for each swap was a mere 0.0038% (.38 basis points).

- The Dealer quotes compared very favorably to the Bloomberg IRSB screen prices. Only three of the best quotes for each of the 15 swaps were outside the screen bid-offers.

- Communications between the Investment Firms and Dealers was nearly instantaneous. Firm price quotes came back from Dealers within seconds, either via Bloomberg messaging or telephone.

- The traders had access to several "live" dealer screens. Some indicated they often execute transactions through dealer screens. The test strongly suggests that screen prices are good indicators of executable market prices.

- Nine of the 10 Dealers from whom quotes were requested provided the best quote on at least one transaction. Five Dealers provided the best quotes on two or more swaps.

The implications of the IRS Test are clear. Its results demonstrate that these markets are extremely liquid with excellent price transparency and competitiveness for standard-structure swaps between active market participants and major dealers. The narrow spreads between the best and worst quotes attest to an extremely competitive marketplace for a variety of plain vanilla swaps. Arguably, the competitiveness of the generic swap market can be viewed as similar to the competitiveness of the US government bond market.

In addition, the IRS test indicates that a high level of price transparency can be provided by dealer screens. Finally, as would be expected given the competitiveness of the market, the IRS Test also suggests that the profitability of interest rate swap customer flow for counterparties with collateralized swap documentation is extremely modest.

Design of the IRS Test

The IRS Test was designed by ISDA, in conjunction with Atrevida. It was carried out on a confidential basis by three non-dealer investment firms ("Investment Firms") who are active users of the derivatives markets. The Investment Firms agreed to participate as long as their identities would remain anonymous. Additionally, each Investment Firm has reviewed and agreed this report.

Each Investment Firm obtained live executable quotes from derivatives dealer firms ("Dealers") on five plain vanilla interest rate swaps. The identities of the Dealers are confidential. See **Annex 1** for a list of the major dealers, only some of whom were involved in the IRS Test.

The test was straightforward and simple in its design. Each of the Investment Firms was asked to obtain firm prices on five interest rate swaps from its Dealers. For each swap, the Firms would ask three Dealers for quotes. The mix of Dealers would be rotated so that, wherever possible, every Dealer having a relationship with the Investment Firm would be asked to quote on at least one swap and no Dealer would be asked for a quote on more than two swaps.

The swaps themselves were selected as representative transactions in the interest rate swap markets:

- in size;
- in maturity; and
- in currency (the US dollar and Euro).

Annex 2 shows the list of swaps requested.

No two swaps were exactly alike. For any maturity, generally only one pay swap and one receive swap was included as part of the test. The five swaps for each Investment Firm were unique to that firm. They contained both US dollar and Euro swaps and were both pay and receive swaps. The five swaps were priced individually by three Dealers, rather than as pairs or all at once. The Dealers were not informed that the prices requested were only a test. They were quoting firm prices. Once the Dealers were selected for each swap quote, the test proceeded, one swap at a time.

Participants

ISDA, which represents participants in the privately negotiated derivatives industry, is among the world's largest global financial trade associations as measured by number of member firms. ISDA was chartered in 1985, and today has over 830 member institutions from 57 countries on six continents. These members include most of the world's major institutions that deal in privately negotiated derivatives, as well as many of the businesses, governmental entities and other end users that rely on over-the-counter derivatives to manage efficiently the financial market risks inherent in their core economic activities.

Since its inception, ISDA has pioneered efforts to identify and reduce the sources of risk in the derivatives and risk management business. Among its most notable accomplishments are: developing the ISDA Master Agreement; publishing a wide range of related documentation materials and instruments covering a variety of transaction types; producing legal opinions on the enforceability of netting and collateral arrangements (available only to ISDA members); securing recognition of the risk-reducing effects of netting in determining capital requirements; promoting sound risk management practices, and advancing the understanding and treatment of derivatives and risk management from public policy and regulatory capital perspectives.

Atrevida Partners, LLC is an investment advisory and risk consulting firm based in Rye, NY. Atrevida advises clients on alternative investments and risk management, offers investment opportunities and manages funds-of-hedge funds and special opportunity funds. Duncan P. Hennes and Stephen A. Sinacore are the founders and principals of Atrevida Partners, LLC, with each having over 25 years' experience in derivatives, trading, risk management, supervision of traders and capital allocation.

One of Atrevida's co-founders, Duncan Hennes, supervised the test in conjunction with two of his colleagues, Marc Sussman and Marion Robinson. Duncan Hennes was formerly Executive Vice President and Treasurer of Bankers Trust Company with direct management responsibility for Bankers Trust's derivatives businesses. He was subsequently CEO of Soros Funds Management and a co-founder of the Promontory Group. Marion Robinson was formerly a Managing Director at Bankers Trust Company and part of its derivatives business since its inception in the early 1980s. She was also a founder member of ISDA and served on its board for five years. Marc Sussman is a trader and portfolio manager. His experience includes the Fixed Income Arbitrage Group at Bankers Trust Company, Soros Fund Management and PFG Fund Advisers where he actively traded OTC derivatives and managed pools of capital, developed risk and trading models and executed trades, both cash and derivatives.

The **Investment Firms** were three large, US-based investment management firms who are active users of the US and international derivatives markets and members of ISDA. They each have trading desks in the US and non-US financial centers and maintain dealing relationships with all major Dealers, including having two-way collateralized ISDA swap documentation in place (under which initial and/or variation margin is provided based on the market values of outstanding positions). They are all of equivalent size and stature in the markets. Therefore, they would all be likely to obtain equivalent pricing.

The **Dealers** were selected by the Investment Firms from a list provided to them of firms that are parties to a series of commitments made to the NY Federal Reserve Bank over the last several years. These firms are generally considered the largest derivatives dealers in the world. (See **Annex 1** for a list of all of these dealers, only ten of whom were actually involved in the IRS Test.)

IRS Test Methodology

The IRS Test was conducted in the last two weeks of September 2010. Representatives of Atrevida and, in some cases, ISDA were either physically present on the trading floors of the Investment Firms or patched in via live teleconference.

The quotes were obtained either by Bloomberg messaging or by telephone. Typically two traders from each Investment Firm requested the quotes: one trader for USD and one trader for Euro. The traders for Euro swaps for two of the Investment Firms were located outside the US. Quotes were obtained from three Dealers who held them open as much as reasonably possible so that all quotes were firm at approximately the same time.

The traders had access to several "live" dealer screens. Some traders indicated they often execute transactions through dealer screens. Atrevida and/or the Investment Firm printed the Bloomberg page IRSB for US dollars or Euros at the approximate time the quotes were received.

Bloomberg IRSB is a "best-market" calculation. At any point in time, the bid rate is equal to the highest bid rate of all the active contributing dealers. The ask rate is the lowest ask rate of all the contributing dealers. Comparing swap prices to the IRSB screens is a reasonable way to benchmark overall bid-offer spreads, competitiveness of pricing and profitability of trades executed at bid and offer rates. Traders, however, generally use screens from multiple dealers for pre-trade pricing data. The IRSB screens used in the IRS Test do not always provide perfect synchronicity of timing because some seconds may have elapsed between firming up the dealer quotes and printing the screens. The screens themselves may not be 100% timely or complete as not all dealers provide pricing to Bloomberg and Bloomberg's methodology may cause very slight delays in price availability.

Results of the Test

Summaries of the results of each of the fifteen test swaps are contained in **Annexes 3, 4 and 5**. A Pro Forma estimate of the Profit and Loss is provided in **Annex 6**.

Annex 3 identifies each Dealer with an ID Number which is consistent for all fifteen tests and summarizes the mix of Dealers and number of quotes per Dealer. As the table shows, a total of 10 Dealers provided quotes: from one quote from Dealer 1 at the low end to six quotes from two Dealers (7 and 9) at the high end -- an average of 4.5 quotes per Dealer.

Annex 3 also indicates the number of best quotes provided by each Dealer. With the exception of Dealer 1 (which only had one chance to quote), all Dealers provided the best quote for at least one swap. Five Dealers provided the best quotes on two or more swaps. Four of the Dealers provided the best quote on one or more swaps in both USD and Euro. While the sample was small, the data indicates that several Dealers competed vigorously for the Investment Firms' business.

Atrevida observed virtually instant communication between the Investment Firms' traders and Dealers. Firm price quotes came back within seconds of the requests.

Annex 4 contains the pricing for each of the fifteen swaps from the Dealers - 45 quotes in all. The difference in pricing between the best to worst quotes for any swap ranged from 0.0000% to 0.013%. The average difference between the best and worst quotes for each swap was a mere 0.0038%.

In the case of Investment Firm B, the results are slightly affected by delays of a minute or so between the respective quotes received. As a result, this analysis could be refined slightly by excluding Investment Firm B. When this firm is excluded, the range of best to worst quotes would be 0.0000% to 0.0070% and the average spread between the best and worst would be 0.0028%.

The narrow spreads between the best and worst quotes attest to an extremely competitive marketplace for a variety of plain vanilla swaps. For example, the present value of 0.0028% on a five-year dollar swap is approximately 1.35 basis points or $13,500 on a $100 million transaction -- less than 1/64%. Arguably, the competitiveness of the generic swap market can be viewed as similar to the competitiveness of the US government bond market.

Annex 5 compares the quotes received to the IRSB screen prices. As noted, there was a small delay between the receipt of the price quotes and printing the IRSB screens. Nonetheless, despite the delay (generally a matter of seconds), a comparison of actual quotes received can be informative and evidences a competitive and transparent marketplace. For example, only three of the best quotes were outside the screen bid-offers. For these three swaps, the average rate outside the screen was 0.0014%. Four of the quotes were exactly on the screen while eight were inside the "best-market." The average of these eight was better than the screens by 0.0045%, nearly half a basis point in rate terms.

If the five swaps of Investment Firm B are excluded from the results in Annex 5, there is little difference in the results. Best pricing for two of their ten swaps fell outside the bid-offer. Four were better and four matched the screen. The average rate of the two quotes outside the screen was 0.00065%, *i.e.* less than seven-hundredths of a basis point. The average improvement on screen pricing was 0.0035% or about a third of a basis point per annum.

The test strongly suggests that screen prices are good indicators of executable market prices. Transparency is excellent.

Finally, **Annex 6** provides a pro forma estimated profit and loss ("P and L") for the 15 transactions for screen prices and the best quotes.

The estimates based on screen pricing assumed the transactions were executed on the bid or offer existing on the screen. P and L was then calculated by marking the swap to a rate halfway between the screen bid and offer (mid-market). This calculation estimated the profitability of swaps to Dealers who matched screen prices and indicates the profitability of interest rate swaps generally.

For example, in the first swap listed in **Annex 6**, the IRSB screen showed a bid of 0.6150%, an offer of 0.620% and a derived mid-market of 0.6175%. Therefore, if a Dealer received at 0.62% (*i.e.*, the client paid at 0.62%), the profitability would be 0.0025% p.a. or $9,960 on a $200 million two year swap.

The estimate based upon screen pricing indicates a profitability of $103,169 before the deduction of any reserves for credit, capital or operational costs. In all, the fifteen swaps had an aggregation notional amount of $1,965 million equivalent of notional amounts with maturities ranging from two to thirty years. The "profitability" is approximately 1/2 of one basis point in price terms.

The estimates made using the actual best quotes were also marked against the screen mid-market except for the three Euro swaps priced by Investment Firm B which requested actual mid-market quotes from the Dealers. For these three swaps, the actual quoted mid-market was used because the IRSB for those swaps was somewhat delayed and would have shown a P and L loss.

For an example of a best quote P and L, consider the second swap listed in **Annex 6**. The best quote was 0.0003% outside the screen mid-market which would have resulted in a P and L of a mere $1,494 on a $250 million two year swap.

The estimate based upon best prices and either the screen mid-market or the dealer mid-market (for the three Euro swaps of Investment Firm B described above) shows a Dealer P and L or $97,113, very close to the screen P and L. There was not a single case where the best quote produced Dealer P and L of as much as one- half basis point per annum.

Annex 1: List of Dealers

Barclays

Bank of America Merrill Lynch

BNP Paribas

Citi

Credit Suisse

Deutsche Bank

Goldman Sachs

HSBC

JP Morgan Chase

Morgan Stanley

RBS

Societe Generale

UBS

Wells Fargo

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Annex 2: List of Trades

Firm	Currency	Amt (mn)	Maturity (yrs)	Pay/Rec
C	USD	200	2	Pay
C	USD	100	5	Pay
C	USD	50	30	Rec
C	EUR	200	5	Rec
C	EUR	100	10	Rec
A	USD	100	3	Rec
A	USD	50	7	Pay
A	USD	250	2	Pay
A	EUR	75	5	Pay
A	EUR	50	7	Rec
B	USD	150	2	Rec
B	USD	50	10	Rec
B	EUR	150	2	Rec
B	EUR	100	10	Pay
B	EUR	50	30	Rec

Summary

Currency	# of Trades		Maturity (Years)	# of Trades		Pay/Receive	# of Trades
USD	8		2	4		Pay	6
Euro	7		3	1		Receive	9
Total	15		5	3		Total	15
			7	2			
			10	3			
			30	2			
			Total	15			

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Annex 3: Summary of Quotes by Dealer

Dealer	USD Trades	Best USD Quotes	Euro Trades	Best Euro Quotes	Total Trades	Best Quoted Total	**Hit Ratio***
1	1	0	-	0	1	0	**0**
2	3	1	2	0	5	1	**20**
3	2	0	2	1	4	1	**25**
4	3	2	2	0	5	2	**40**
5	2	0	3	1	5	1	**20**
6	2	2	3	1	5	3	**60**
7	3	1	3	2	6	3	**50**
8	2	1	1	0	3	1	**33**
9	3	2	3	2	6	4	**66**
10	3	2	2	1	5	3	**60**
Total	24	11	21	8	45	19	**42**

*** Percent of transactions that firm bid on in which it provided best quote**

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Annex 4: Results of Test – 15 Trades/ 3 Dealers Each

Firm	Currency	Amt (mn)	Maturity (yrs)	Pay/Rec	Date (2010)	Time	Dealer	Quote	Best Quote	Avg Quote
C	USD	200	2	Pay	Sep 22	9:28:25 am	9	0.6200	0.6200	0.6207
							10	0.6200		
							3	0.6220		
C	USD	100	5	Pay	Sep 22	9:32:52 am	2	1.5470	1.5450	1.5467
							8	1.5480		
							6	1.5450		
C	USD	50	30	Rec	Sep 22	9:36:32 am	7	3.4000	3.4070	3.4023
							4	3.4000		
							2	3.4070		
C	EUR	200	5	Rec	Sep 22	9:42:57 am	5	1.9840	1.9840	1.9817
							9	1.9800		
							3	1.9810		
C	EUR	100	10	Rec	Sep 22	9:47:05 am	7	2.6770	2.6770	2.6767
							6	2.6760		
							10	2.6770		
A	USD	100	3	Rec	Sep 24	11:07:16 am	10	0.9250	0.9250	0.9250
							8	0.9250		
							4	0.9250		
A	USD	50	7	Pay	Sep 24	11:09:20 am	5	2.1310	2.1280	2.1297
							7	2.1300		
							6	2.1280		
A	USD	250	2	Pay	Sep 24	11:11:35 am	9	0.6310	0.6310	0.6320
							1	0.6325		
							3	0.6325		
A	EUR	75	5	Pay	Sep 24	10:59:44 am	2	1.9770	1.9730	1.9750
							5	1.9750		
							7	1.9730		
A	EUR	50	7	Rec	Sep 24	11:03:43 am	9	2.3090	2.3090	2.3080
							6	2.3070		
							4	2.3080		

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Annex 4 Continued

Firm	Currency	Amt (mn)	Maturity (yrs)	Pay/Rec	Date (2010)	Time	Dealer	Quote	Best Quote	Avg Quote
B	USD	150	2	Rec	Sep 30	12:04:04 pm	9	0.6025	0.6125	0.6079
						12:01:33 pm	4	0.6125		
						12:02:57 pm	10	0.6088		
B	USD	50	10	Rec	Sep 30	12:04:47 pm	7	2.5700	2.5700	2.5689
						12:05:24 pm	2	2.5688		
						12:06:03 pm	5	2.5680		
B	EUR	150	2	Rec	Sep 30	9:52:11 am	9	1.4700	1.4770	1.4703
						9:57:50 am	4	1.4770		
						10:00:17 am	2	1.4640		
B	EUR	100	10	Pay	Sep 30	10:04:32 am	7	2.5990	2.5975	2.5982
						10:09:32 am	5	2.5980		
						10:13:38 am	3	2.5975		
B	EUR	50	30	Rec	Sep 30	10:17:07 am	8	2.8525	2.8575	2.8553
						10:19:47 am	6	2.8575		
						10:22:24 am	10	2.8560		

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Annex 5: Quotes vs. Screens

Firm	Currency	Amt (mn)	Maturity (yrs)	Pay/Rec	Best Quote	Avg Quote	Hi-Low Spread	IRSB vs Best Quote	IRSB/Best Quote Compare	IRSB vs Avg Quote	IRSB/Avg Quote Compare	IRSB Bid	IRSB Ask
C	USD	200	2	Pay	0.6200	0.6207	0.0020	0.000	Same	0.0007	Worse	0.61500	0.62000
C	USD	100	5	Pay	1.5450	1.5467	0.0030	(0.001)	**Better**	0.0009	Worse	1.54400	1.54580
C	USD	50	30	Rec	3.4070	3.4023	0.0070	0.008	**Better**	0.0033	**Better**	3.39900	3.40300
C	EUR	200	5	Rec	1.9840	1.9817	0.0030	0.000	Same	(0.0023)	Worse	1.98400	1.98400
C	EUR	100	10	Rec	2.6770	2.6767	0.0010	0.000	Same	(0.0003)	Worse	2.67700	2.68000
A	USD	100	3	Rec	0.9250	0.9250	0.0000	0.0010	**Better**	0.0010	**Better**	0.92400	0.92710
A	USD	50	7	Pay	2.3090	2.3080	0.0030	0.0010	Worse	0.0026	Worse	2.12330	2.12702
A	USD	250	2	Pay	0.6310	0.6320	0.0015	0.0003	Worse	0.0013	Worse	0.63070	0.63070
A	EUR	75	5	Pay	1.9730	1.9750	0.0040	(0.004)	**Better**	(0.0020)	**Better**	1.97600	1.97700
A	EUR	50	7	Rec	2.3090	2.3080	0.0010	0.0000	Same	(0.0010)	Worse	2.30900	2.31100
B	USD	150	2	Rec	0.6125	0.6079	0.0062	0.0040	**Better**	(0.0006)	Worse	0.60850	0.60850
B	USD	50	10	Rec	2.5700	2.5689	0.0012	(0.003)	Worse	(0.0041)	Worse	2.57300	2.57300
B	EUR	150	2	Rec	1.4770	1.4703	0.0130	0.0060	**Better**	(0.0007)	Worse	1.47100	1.47100
B	EUR	100	10	Pay	2.5975	2.5982	0.0015	(0.006)	**Better**	(0.0048)	**Better**	2.60300	2.60300
B	EUR	50	30	Rec	2.8575	2.8553	0.0050	0.0063	**Better**	0.0041	**Better**	2.85120	2.85600

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Annex 6: Pro Forma P and L

Firm	Currency	Amount (mn)	USD Amount	Maturity (yrs)	Pay/Rec	Screen P&L (USD)	Best Quote P&L (USD)
C	USD	200	200	2	Pay	9,960	9,960
C	USD	100	100	5	Pay	4,370	486
C	USD	50	50	30	Rec	19,497	9,749
C	EUR	200	280	5	Rec	0	0
C	EUR	100	140	10	Rec	18,923	18,923
A	USD	100	100	3	Rec	4,599	1,632
A	USD	50	50	7	Pay	6,175	9,429
A	USD	250	250	2	Pay	0	1,494
A	EUR	75	105	5	Pay	2,539	(17,772)
A	EUR	50	70	7	Rec	4,624	4,624
B	USD	150	150	2	Rec	0	(11,952)
B	USD	50	50	10	Rec	0	13,607
B	EUR	150	210	2	Rec	0	4,177
B	EUR	100	140	10	Pay	0	18,923
B	EUR	50	70	30	Rec	32,481	33,834
Total			**$1,965**			**$103,169**	**$97,113**