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MIBOR OIS Curve – A Concept Note on Methodology

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ABSTRACT

The Indian OTC derivatives market has grown significantly since the implementation of the structural and operational measures such as CCIL's Trade Repository, launch of non-guaranteed settlement of cash flows and CCP clearing for Rupee denominated IRS/FRA trades by CCIL. In addition to this, CCIL's anonymous dealing system ASTROID for IRS trades and the portfolio compression services offered from July 2011 by CCIL have helped to bring significant momentum to this market segment. A study of the OIS microstructure between April 2009 to March 2017 shows that 1-yr, 2-y and 5-yr contracts are very liquid compared to long term contracts like 7-yr and 10-yr. Generally the OIS curve trades below the G-Sec curve, while the short term OIS rates (upto 6 months) also trade below the T-Bill, rate with a very high correlation.

To arrive at the methodology to compute the benchmark OIS curve, the study suggests that the illiquid short term tenors like 1M, 2M and 3M could be polled, while benchmark calculation could be discontinued for long-term illiquid tenors like 84 months and 120 months. The paper suggests two methods for calculation of the benchmark rate, with a criteria of minimum 3 trades to use the traded data for each tenor. The priority is to be given to traded data and a suitable fallback mechanism is defined to calculate rates for non-traded tenors. The T-tests of the output of these two methods did not show any significant statistical differences. The paper also suggests that in case polling is not feasible for shorter tenors, then their calculation could be linked to the FBIL TB Curve released by FBIL.

JEL Classification: G120, E44,

Keywords: Benchmark, OTC Derivatives, OIS Curve, T-Bill, Spreads, Anonymous Trading

[1] SVP, CCIL

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1. INTRODUCTION

All MIBOR-OIS contracts are standardized as per the RBI circular RBI/2012-13/396 IDMD.PCD.2191/14.03.01/2012-13 dated January 28, 2013. FIMMDA also issued the guidelines to its members on March 28, 2013 on the same. The objective of standardization was to help in improving tradability and facilitate centralized clearing and settlement of IRS contracts. The centralized clearing process has been initiated by CCIL with introduction of both Guaranteed and non-Guaranteed settlement. The standardized parameters are as follows:

- Notional Principal Amount: Rs.25 crores and multiples of Rs.5 crores thereafter.
- Tenor: Rolling 1,2,3,6,9,12 months and 2, 3, 4, 5, 7, and 10 years.
- Settlement Calculations: (i) for contracts of 1 year and below – at maturity and (ii) for contracts of maturity beyond 1 year – on a semi–annual basis
- Floating Rate: MIBOR
- Trading Hours: 9.00 am to 5.00 pm (Mondays to Fridays)

2. MARKET GROWTH

Over the years, the OTC derivatives market has grown significantly. CCIL's Trade Reporting platform for Reporting of Rupee Interest Rate Swaps (IRS) and Forward Rate Agreement (FRA) became operational on August 30, 2007 to enable all entities to report their trades to CCIL Trade Repository. Taking it one step further, CCIL introduced Non-Guaranteed Settlement of Cash Flows on Nov 22, 2008. CCIL launched CCP Clearing of Rupee denominated Interest Rate Swaps and Forward Rate Agreements on March 28, 2014. CCIL also launched ASTROID, the Anonymous IRS Dealing System for trading in OTC rupee derivative trades on August 3, 2015. To bring down the notional outstanding and better operational flexibility, CCIL also introduced portfolio compression with effect from July 2011.

Foreign Banks remain the largest participants in the market with 58% market share. Top 10 participants account for about 87% of the total market (Table 1 & 2). Hence, the market depth has not improved much after many infrastructural and policy changes introduced. Nationalized banks having the largest exposure to interest rate risk in terms of Balance Sheet size are not regular users of this market. In recent times, the value of trades executed in the market has been showing a decline. The falling trend has been observed after the financial crisis. (Table 3)

After the introduction of portfolio compression in July 2011, the notional outstanding have come down. The portfolio compression has helped in winding off of uneconomic trades for the market participants. (Table 4)

3. DATA ANALYSIS

We looked at transactions executed by market participants from 02-Apr-2009 to 10-Mar-2017 (1902 days) for looking deeper into the market microstructure. (Table 5)

The 1-Year, 2-Year and 5-Year contracts are most preferred contracts in OIS market. And trades for long term contracts like 7-Year and 10-Year are very scanty. The Year-wise Descriptive Statistics of the OIS deals is given in Table 6. We looked at the behavior of the spread between OIS and comparable G-Sec yields for relatively liquid tenors like 6-Month, 1, 2, 3, 4 and 5 years. It has been found that OIS was by and large trading below the G-Sec curve. Globally, OIS is considered as a credit product and trades above G-Secs but we see a reverse trend in Indian market. (Table 7)

4. RECENT DEVELOPMENTS

We analyzed the recent market data (April 3, 2017 to Sep 30, 2017) to understand if the liquidity in short term tenors have improved to make the benchmark calculation convenient. We did not find any trade in 84 months and only found two trades in 120 months. With regard to shorter end, there has been no improvement upto 3 months and hence it will be difficult to calculate any benchmark on the basis of such low incidence of trading. (Table 8)

5. OIS CURVE AND T-BILLS

Since short term tenors trading incidence is low, we explored possibilities of finding out proxies for supporting the OIS rate computation using proxies when minimum criteria of computation is not met. Since the TBs and OIS are similar in nature (spot rates), we explored if TB rates can be used along with a spread to reflect the OIS rates for short terms upto 6 months. The data analysis for the period from Apr'12 to Sep'17 reveals very high correlation between TB and OIS. (Table 9)

Since TB rates have very high correlation with OIS curves, we may consider the TB rates and the spread for constructing the OIS curve. For most of the OIS deals, the spread is negative with TB (i.e. OIS trades lower than TBs). (Table 10) If 3 trades criteria are used, the rate computation at the shorter end (upto 3 months) using traded rates will be a big challenge as very few trades take place in those segments. (Table 11)

6. ANALYSIS OF TRADED AND COMPUTED RATES

Since 2015, the liquidity in contracts of 6M and above has shown significant improvement and we thought it prudent to look at the data pertaining to 2015-17 for further analysis to decide on the methodology for estimation of OIS curve. For 1M, 2M and 3M tenors, polling

may be the possible solution. Benchmarks Calculation for 84 and 120 months may be discontinued as market is extremely illiquid in these tenors. (Table 12)

Since a large number of days meet the criteria of minimum 3 trades for the above Tenors, we may use the traded data for computation of the OIS curve using traded data points. We used the following methods for computation of the OIS curve.

Method I

1. Priority is given to traded data for each Tenor.
2. All missing points will be interpolated using day's OIS curve if minimum 3 points are available between 6M and 5Y.
3. If less than 3 points are available, then the rate is computed as the previous day's OIS rate of the Tenor plus average of spread of nearby Tenors between yesterday and today.
4. If only one traded point, then the previous day's rates are repeated keeping only the traded point.

Method II

1. Priority is given to traded data for each Tenor.
2. 2Y-5Y Tenors to be computed first followed by 1Y and then 6M and 9M.
3. For Computation of missing tenors between 2Y-5Y, the traded points between 1Y-5Y to be considered.

The extreme tenors (i.e. 2Y and 5Y) will be first computed. In case of 5Y, the rate is computed by taking the previous day's rate for that tenor and adding to it the spread of the nearby traded tenor. In case of 2Y, the rate is computed as the previous day's rate plus the average of the spread of 1Y and the spread of the nearest available tenor (3Y or 4Y or 5Y). In case 1Y rate is not traded; the 2Y rate is computed as the previous day's rate and the spread of the nearby traded tenor (3Y or 4Y or 5Y). The 3Y rate and 4 Y rate is then computed as the previous day's rate plus the average of the spread of the nearest available tenors (traded/calculated).

In case we fail to compute the rates for 2Y-5Y using the above method then we repeat the previous days' rate for the tenors.

The 1Y tenor is calculated only after obtaining all the tenors between 2Y-5Y. The 1Y tenor is calculated as the previous day's rate plus the average of the spread of 9M (6M in case 9M is not traded) and the spread of 2Y. In case 6M and 9M are not traded, then the 1Y rate would be computed using the previous day's rate plus the spread of the 2Y rate (traded/calculated).

The 6M and 9M rates are calculated only after all the tenors between 1Y-5Y are obtained. The 6M rate is calculated as the previous day's rate plus the spread of the 9M rate in case 9M is traded and in case, the 9M is not traded, it is calculated as the previous day's rate plus the spread of the 1Y rate. The 9M rate is calculated as the previous day's rate plus the average spread of the 6M and the spread of the 1Y (traded/calculated). (Table 13)

We produce the results below and we did not find much difference between method I and Method II (Annexure A). We ran a two sample t-test to see the structural difference of output of traded and computed data and found that the 3Y and 4Y have marginal difference in data structure. Other months do not have any statistically significant difference. However, when we ran year-wise t-test for 2015, 2016 and 2017, we did not find any difference in traded and computed rates for individual years (Annexure 2A, 2B and 2C). Hence, any of the above 2 methods can be used for estimation of OIS curve. However, Method I will be easier to implement through software while Method II will take mode coding effort and testing.

In case, polling for shorter term is not feasible, then it must be linked to TB curve. Since FBIL has been releasing TB curves on daily basis, we may use the following methods for establishing OIS curve at the lower end.

If trades (minimum 3 trades are executed in the market), the same would be used to compute the weighted average rate of OIS. Necessary outlier criteria of +/-3SD will be used for computation and surviving trades must be 3 to compute the rate for the Tenor.
The starting boundary point would be constructed first – i.e. 1 Month, in case of missing data.

If OIS for 1-month is not traded for a day, the point must be first established using TB rate for the Tenor plus the previous day's spread with TB for the Tenor. Here the spread would mean the spread between the previous TB rate and OIS rate for the 1-month tenor. If that is not available, then the OIS rate for 1-month would be T-Bills rates for the Tenor plus the spread of the nearest Tenor upto 6 month. Here the spread would mean the spread between the TB rate and the OIS rate of the nearest Tenor.

OIS rates for Tenor 2M and 3M would be constructed using TB rate for the spread of the previous day for the Tenor. If the same is not available, it would be constructed using TB rate plus spread of nearest Tenor available. If both points are available, then it would be an average spread.

Table 1: Interest Rate Swap (MIBOR) Market Share (Amount in ` Crore and Share in %) - March 2017				
Category	**Deals**	**Market Share**	**Notional Amount**	**Market Share**
Foreign Banks	2,151	55.10	245555	57.98
Nationalized Banks	111	2.84	8925	2.11
Primary Dealers	795	20.36	87625	20.69
Private Banks	847	21.70	81435	19.23
Total	3,904	100.00	423540	100.00

Table 2: Top 'N' Market Share (%)	
	MIBOR
Top 1	24.38
Top 5	65.40
Top 10	86.83

Table 3: IRS (MIBOR) Trade Summary (Matched) (Amount in ` Crore)		
Period	**MIBOR**	
	Trades	**Value**
2007-08	79495	4728077
2008-09	40912	2644846
2009-10	20352	1452058
2010-11	33057	2359722
2011-12	33642	2451048
2012-13	22713	2021607
2013-14	25514	2296732
2014-15	21153	2029225
2015-16	20746	2132920
2016-17	21036	1923460

Table 4: Outstanding Position in IRS Transactions (Amount ` Crore)		
Period	MIBOR	
	Trades	Notional Sum
2007-08	61665	3655595
2008-09	23732	1394018
2009-10	29853	1748787
2010-11	43197	2645709
2011-12	27613	1975121
2012-13	20958	1554242
2013-14	17782	1447259
2014-15	17279	1495595
2015-16	16858	1368453
2016-17	19901	1417357

Table 5: Descriptive Statistics of Short Term Contracts (Amount ` Crore)						
Tenor M	1	2	3	6	9	12
Deals	1988	1534	3869	7133	6521	53385
Settlement	52287	35121	72708	103104	67227	456844
Notional	674725	472132	982319	1400325	934087	6255676
Days	536	476	956	1410	1302	1883
Descriptive Statistics of Long Term Contracts						
Tenor M	24	36	48	60	84	120
Deals	28717	15818	8507	63949	82	201
Settlement	116876	52030	25262	188859	276	652
Notional	1674483	741812	359841	2612357	3837	8801
Days	1845	1715	1484	1896	52	106

Table – 6: Year-wise Descriptive Statistics of the OIS Trades															
	1M					2M					3M				
Years	Average	StdDev	Max	Min	Day count	Average	StdDev	Max	Min	count	Average	StdDev	Max	Min	count
2009	3.47	0.43	3.95	3.15	3	3.36	0.04	3.40	3.30	4	3.58	0.16	3.93	3.30	33
2010	4.97	1.10	6.95	3.53	46	4.68	1.00	6.90	3.62	34	5.22	1.13	7.09	3.79	67
2011	7.68	0.45	8.59	6.73	33	7.66	0.62	8.65	6.65	22	7.95	0.52	8.62	6.98	64
2012	8.57	0.47	9.30	7.89	45	8.32	0.48	9.06	7.70	34	8.11	0.35	8.86	7.66	97
2013	8.72	1.23	11.53	7.14	76	8.48	1.05	11.20	7.29	74	8.50	1.10	11.00	7.25	170
2014	8.48	0.44	9.66	8.10	115	8.38	0.24	9.00	8.00	89	8.40	0.23	8.82	7.98	135
2015	7.66	0.60	8.86	6.86	106	7.52	0.43	8.42	6.88	127	7.47	0.39	8.26	6.90	196
2016	6.77	0.60	7.98	5.97	96	6.72	0.41	7.38	5.95	79	6.60	0.35	7.18	5.91	158
2017	6.25	0.09	6.38	6.10	18	6.24	0.07	6.35	6.15	13	6.28	0.05	6.35	6.20	36

	6M					9M					12M				
Years	Average	StdDev	Max	Min	Day count	Average	StdDev	Max	Min	count	Average	StdDev	Max	Min	count
2009	3.92	0.27	4.67	3.50	82	4.30	0.34	4.83	3.60	69	4.42	0.38	5.14	3.76	171
2010	5.32	0.96	7.00	4.20	144	5.43	0.85	7.08	4.52	99	5.73	0.78	7.13	4.75	240
2011	7.88	0.39	8.60	6.90	143	7.84	0.35	8.41	6.94	116	7.81	0.30	8.35	7.03	238
2012	8.01	0.26	8.52	7.58	150	7.92	0.22	8.36	7.54	162	7.84	0.19	8.22	7.49	242
2013	8.26	0.98	10.77	7.17	202	8.19	0.93	10.38	7.09	180	8.09	0.80	10.12	7.07	242
2014	8.39	0.17	8.75	7.97	204	8.36	0.24	8.73	7.81	194	8.36	0.27	8.72	7.73	230
2015	7.42	0.25	7.98	7.06	224	7.41	0.22	7.81	7.01	218	7.40	0.22	7.77	7.01	239
2016	6.57	0.27	7.08	5.92	220	6.58	0.27	7.05	5.92	224	6.58	0.27	7.07	5.91	236
2017	6.27	0.08	6.38	6.17	41	6.28	0.10	6.40	6.17	40	6.29	0.12	6.44	6.15	45

	24M					36M					48M				
Years	Average	StdDev	Max	Min	Day count	Average	StdDev	Max	Min	count	Average	StdDev	Max	Min	count
2009	5.14	0.46	5.85	4.12	165	5.61	0.50	6.34	4.55	144	6.02	0.47	6.67	4.88	131
2010	6.12	0.52	7.22	5.35	239	6.49	0.39	7.43	5.72	226	6.76	0.33	7.62	6.02	208
2011	7.56	0.29	8.17	6.99	236	7.59	0.36	8.32	6.88	231	7.59	0.43	8.37	6.70	197

2012	7.41	0.19	7.79	7.09	228	7.28	0.20	7.69	6.90	219	7.24	0.20	7.68	6.89	163
2013	7.73	0.69	9.40	6.72	236	7.69	0.66	9.20	6.71	216	7.63	0.65	8.99	6.70	161
2014	8.03	0.33	8.51	7.29	228	7.98	0.39	8.52	7.12	199	8.02	0.41	9.02	7.10	182
2015	7.10	0.17	7.38	6.75	234	7.04	0.16	7.34	6.73	210	7.03	0.15	7.34	6.73	188
2016	6.43	0.27	7.06	5.75	232	6.45	0.26	6.90	5.84	224	6.51	0.24	6.91	5.89	208
2017	6.18	0.18	6.44	5.98	47	6.26	0.20	6.52	6.04	46	6.36	0.21	6.64	6.11	46

	60M					**84M**					**120M**				
Years	**Average**	**StdDev**	**Max**	**Min**	**Day count**	**Average**	**StdDev**	**Max**	**Min**	**count**	**Average**	**StdDev**	**Max**	**Min**	**count**
2009	6.35	0.44	6.99	5.14	173	6.63	0.60	7.33	5.63	9	6.89	0.57	7.43	6.05	9
2010	7.00	0.26	7.73	6.31	240	7.17	0.24	7.42	6.79	11	7.51	0.31	8.89	6.97	40
2011	7.61	0.48	8.41	6.65	238	7.08	0.20	7.37	6.87	5	7.77	0.53	8.36	6.84	29
2012	7.24	0.20	7.67	6.87	242						7.19	0.10	7.27	7.04	4
2013	7.72	0.66	9.25	6.72	244	8.32	0.14	8.57	8.04	10	7.97	0.58	8.45	7.19	8
2014	7.99	0.42	8.63	7.11	232	8.54	0.07	8.59	8.49	2	8.52	-	8.52	8.52	1
2015	7.02	0.15	7.34	6.73	240	6.89	0.11	6.96	6.76	3	6.94	0.01	6.94	6.93	2
2016	6.56	0.22	6.94	6.04	241	6.38	0.32	6.74	5.97	8	6.45	0.28	6.83	6.13	11
2017	6.45	0.21	6.75	6.20	46	6.54	0.20	6.70	6.19	5	6.48	0.28	6.70	6.17	3

Table 7: Spread between OIS and comparable G-Sec yields				
Tenors	**Observations**	**Mean**	**Median**	**STDEV**
6M	1411	0.1474	0.1753	0.2120
12M	1884	0.2163	0.2305	0.2262
24M	1846	0.5238	0.5302	0.2882
36M	1716	0.5914	0.5862	0.3162
48M	1485	0.6107	0.5968	0.3223
60M	1897	0.6393	0.6302	0.3431

Table 8: Information on Recent Trades (April 3, 2017 to Sep 30, 2017)											
Month	**Params**	**M1**	**M2**	**M3**	**M6**	**M9**	**M12**	**M24**	**M36**	**M48**	**M60**
Apr-17	Deals	46	16	27	104	110	262	373	115	142	490
	Days	10	8	9	18	17	18	18	18	17	18
	Notional	17200	3400	6700	19725	15175	50820	21675	4125	5600	20765
	Rate	6.17%	6.22%	6.25%	6.34%	6.40%	6.45%	6.46%	6.55%	6.64%	6.72%
May-17	Deals		1	8	69	85	229	356	194	273	611
	Days		1	6	17	17	21	21	20	21	21
	Notional		200	800	16615	16315	34225	24080	10950	14015	22425
	Rate		6.28%	6.29%	6.33%	6.40%	6.46%	6.43%	6.48%	6.57%	6.67%
Jun-17	Deals	8	15	49	142	117	433	510	348	365	857
	Days	4	4	14	20	18	21	21	21	21	21
	Notional	4700	3650	11700	33505	22000	72335	26175	17045	14935	39300
	Rate	6.25%	6.23%	6.24%	6.21%	6.20%	6.25%	6.18%	6.19%	6.26%	6.29%
Jul-17	Deals	9	1	58	92	96	290	296	298	168	495
	Days	4	1	12	18	18	21	21	20	20	21
	Notional	2550	250	23075	15425	12510	42065	20910	16240	8665	21975
	Rate	6.15%	6.11%	6.13%	6.15%	6.21%	6.22%	6.11%	6.15%	6.21%	6.27%
Aug-17	Deals	10	14	36	88	141	367	228	336	223	596
	Days	7	3	7	18	19	20	19	19	20	20
	Notional	5800	4600	18525	27765	21025	45270	16770	17045	7945	28480
	Rate	6.02%	6.06%	6.05%	6.09%	6.15%	6.16%	6.03%	6.08%	6.14%	6.18%
Sep-17	Deals	15	24	102	202	365	506	371	485	330	1020
	Days	7	7	16	21	21	21	21	21	21	21
	Notional	8750	3250	22200	47305	48295	64940	21525	23980	13705	42875
	Rate	6.01%	6.03%	6.03%	6.07%	6.11%	6.13%	6.02%	6.08%	6.15%	6.23%

Table 9: Correlation between OIS and TB (only traded data points) (Apr'12-Sep'17)								
	OIS1M	**OIS2M**	**OIS3M**	**OIS6M**	**TB1M**	**TB2M**	**TB3M**	**TB6M**
OIS1M	1	0.97	0.96	0.95	0.95	0.96	0.96	0.95
		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
OIS2M	0.97	1	0.99	0.98	0.96	0.98	0.98	0.97
	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
OIS3M	0.96	0.99	1	0.99	0.98	0.98	0.99	0.98
	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001
OIS6M	0.95	0.98	0.99	1	0.97	0.98	0.98	0.99
	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001	<.0001
TB1M	0.95	0.96	0.98	0.97	1	0.99	0.99	0.98
	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001	<.0001
TB2M	0.96	0.98	0.98	0.98	0.99	1	1.00	0.99
	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001	<.0001
TB3M	0.96	0.98	0.99	0.98	0.99	1.00	1	1.00
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001
TB6M	0.95	0.97	0.98	0.99	0.98	0.99	1.00	1
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	

Table 10 :Descriptive Statistics of Spread between TB and OIS (April'12-Sep'17)				
Parameters	**spread 1M**	**spread 2M**	**spread 3M**	**spread 6M**
Mean	4.26	-10.21	-17.13	-21.11
Standard Error	1.58	1.01	0.75	0.58
Median	-3.52	-13.17	-17.57	-23.52
Standard Deviation	34.30	21.08	21.74	19.38
Sample Variance	1176.18	444.17	472.53	375.52
Kurtosis	1.74	4.49	43.87	58.87
Skewness	1.29	1.31	-2.62	-3.19
Range	192.18	174.95	409.54	384.55
Minimum	-75.82	-70.36	-316.04	-331.78
Maximum	116.36	104.59	93.50	52.77
Coeff. of variation	8.05	-2.06	-1.27	-0.92
Observations	469	433	841	1125

Table 11: Trading Days with Minimum 3 trades (April'09 to Sep'17)										
Year	**M1**	**M2**	**M3**	**M6**	**M9**	**M12**	**M24**	**M36**	**M48**	**M60**
2009		2	9	28	29	153	157	113	97	166
2010	27	14	34	54	38	236	232	212	155	237
2011	12	6	22	68	47	236	227	214	153	237
2012	21	5	44	58	88	240	221	181	85	240
2013	34	30	97	145	112	239	222	177	89	241
2014	68	39	76	142	125	222	204	143	108	229
2015	50	66	145	192	183	232	214	154	120	239
2016	41	40	88	181	176	225	201	182	145	238
2017	23	13	60	121	132	170	173	168	163	181

Table 12: Trade Summary – Days Traded (January 2015-December 2017)							
Tenor=>	**6M**	**9M**	**1Y**	**2Y**	**3Y**	**4Y**	**5Y**
Days Traded	76%	75%	95%	89%	78%	67%	99%

Table 13: OIS Rate Computation (Jan 2015 to Dec 2017 – 723 trading days)							
Tenor =>	**6M**	**9M**	**1Y**	**2Y**	**3Y**	**4Y**	**5Y**
Days Traded	76%	75%	95%	89%	78%	67%	99%
Trade Rate %	6.7517	6.7528	6.7614	6.5793	6.5348	6.5704	6.6719
Method I (%)	6.7318	6.7398	6.7508	6.5891	6.5989	6.6360	6.6732
Method II (%)	6.7300	6.7380	6.7538	6.5782	6.5906	6.6327	6.6729

ANNEXURE A - METHOD 1 VS METHOD 2

Tenor=6M

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_1	723	6.7318	0.5531	0.0206	5.7087	7.9729
METHOD_2	723	6.73	0.5568	0.0207	5.9214	7.975
Diff (1-2)		0.00172	0.5549	0.0292		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_1		6.7318	6.6914	6.7721	0.5531	0.5259	0.5831
METHOD_2		6.73	6.6894	6.7707	0.5568	0.5295	0.5871
Diff (1-2)	Pooled	0.00172	-0.0555	0.059	0.5549	0.5354	0.5759
Diff (1-2)	Satterthwaite	0.00172	-0.0555	0.059			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	1444.00	0.06	0.95
Satterthwaite	Unequal	1443.90	0.06	0.95

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	722	722	1.01	0.8567

Tenor=9M

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_1	723	6.7398	0.5317	0.0198	5.7283	7.8689
METHOD_2	723	6.738	0.5284	0.0197	5.9175	7.8093
Diff (1-2)		0.00187	0.5301	0.0279		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_1		6.7398	6.701	6.7787	0.5317	0.5057	0.5607
METHOD_2		6.738	6.6994	6.7765	0.5284	0.5025	0.5571
Diff (1-2)	Pooled	0.00187	-0.0528	0.0566	0.5301	0.5114	0.5501
Diff (1-2)	Satterthwaite	0.00187	-0.0528	0.0566			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	1444.00	0.07	0.95
Satterthwaite	Unequal	1443.90	0.07	0.95

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	722	722	1.01	0.8652

Tenor=1Y						
Class	**N**	**Mean**	**Std Dev**	**Std Err**	**Minimum**	**Maximum**
METHOD_1	723	6.7508	0.524	0.0195	5.7479	7.7711
METHOD_2	723	6.7538	0.5221	0.0194	5.9055	7.7711
Diff (1-2)		-0.0029	0.523	0.0275		

Class	**Method**	**Mean**	**95% CL Mean**		**Std Dev**	**95% CL Std Dev**	
METHOD_1		6.7508	6.7126	6.7891	0.524	0.4983	0.5525
METHOD_2		6.7538	6.7157	6.7919	0.5221	0.4965	0.5505
Diff (1-2)	**Pooled**	-0.0029	-0.0569	0.051	0.523	0.5046	0.5428
Diff (1-2)	**Satterthwaite**	-0.0029	-0.0569	0.051			

Method	**Variances**	**DF**	**t Value**	**Pr > |t|**
Pooled	Equal	1444.00	-0.11	0.91
Satterthwaite	Unequal	1444.00	-0.11	0.91

Equality of Variances				
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Folded F	722	722	1.01	0.9246

Tenor=2Y						
Class	**N**	**Mean**	**Std Dev**	**Std Err**	**Minimum**	**Maximum**
METHOD_1	723	6.5891	0.4368	0.0162	5.7482	7.462
METHOD_2	723	6.5782	0.435	0.0162	5.7482	7.38
Diff (1-2)		0.0109	0.4359	0.0229		

Class	**Method**	**Mean**	**95% CL Mean**		**Std Dev**	**95% CL Std Dev**	
METHOD_1		6.5891	6.5572	6.621	0.4368	0.4153	0.4605
METHOD_2		6.5782	6.5464	6.6099	0.435	0.4136	0.4586
Diff (1-2)	**Pooled**	0.0109	-0.034	0.0559	0.4359	0.4205	0.4524
Diff (1-2)	**Satterthwaite**	0.0109	-0.034	0.0559			

Method	**Variances**	**DF**	**t Value**	**Pr > |t|**
Pooled	Equal	1444.00	0.48	0.63
Satterthwaite	Unequal	1444.00	0.48	0.63

Equality of Variances				
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**
Folded F	722	722	1.01	0.9114

Tenor=3Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_1	723	6.5989	0.3907	0.0145	5.8353	7.3526
METHOD_2	723	6.5906	0.3859	0.0144	5.8353	7.3388
Diff (1-2)		0.00829	0.3883	0.0204		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_1		6.5989	6.5704	6.6274	0.3907	0.3716	0.412
METHOD_2		6.5906	6.5624	6.6188	0.3859	0.3669	0.4068
Diff (1-2)	Pooled	0.00829	-0.0318	0.0484	0.3883	0.3746	0.403
Diff (1-2)	Satterthwaite	0.00829	-0.0318	0.0484			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	1444.00	0.41	0.68
Satterthwaite	Unequal	1443.80	0.41	0.68

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	722	722	1.03	0.7368

Tenor=4Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_1	723	6.636	0.3513	0.0131	5.8895	7.338
METHOD_2	723	6.6327	0.3496	0.013	5.8895	7.338
Diff (1-2)		0.00334	0.3505	0.0184		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_1		6.636	6.6104	6.6617	0.3513	0.334	0.3704
METHOD_2		6.6327	6.6072	6.6582	0.3496	0.3325	0.3687
Diff (1-2)	Pooled	0.00334	-0.0328	0.0395	0.3505	0.3381	0.3637
Diff (1-2)	Satterthwaite	0.00334	-0.0328	0.0395			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	1444.00	0.18	0.86
Satterthwaite	Unequal	1444.00	0.18	0.86

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	722	722	1.01	0.9011

Tenor=5Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_1	723	6.6732	0.3209	0.0119	6.0414	7.3383
METHOD_2	723	6.6729	0.3205	0.0119	6.0414	7.3383
Diff (1-2)		0.00032	0.3207	0.0169		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_1		6.6732	6.6498	6.6966	0.3209	0.3052	0.3384
METHOD_2		6.6729	6.6495	6.6963	0.3205	0.3048	0.338
Diff (1-2)	Pooled	0.00032	-0.0328	0.0334	0.3207	0.3094	0.3329
Diff (1-2)	Satterthwaite	0.00032	-0.0328	0.0334			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	1444.00	0.02	0.98
Satterthwaite	Unequal	1444.00	0.02	0.98

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	722	722	1	0.976

Annexure 2 A - T Test Results for Traded vs Method 2

Year=2015 Tenor=6M

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	241	7.4205	0.2589	0.0167	7.0611	7.975
Traded	192	7.4228	0.2413	0.0174	7.0611	7.9729
Diff (1-2)		-0.00231	0.2513	0.0243		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		7.4205	7.3876	7.4533	0.2589	0.2376	0.2843
Traded		7.4228	7.3884	7.4571	0.2413	0.2194	0.2682
Diff (1-2)	Pooled	-0.00231	-0.0501	0.0455	0.2513	0.2355	0.2692
Diff (1-2)	Satterthwaite	-0.00231	-0.0497	0.0451			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	431.00	-0.10	0.92
Satterthwaite	Unequal	420.47	-0.10	0.92

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	240	191	1.15	0.311

Year=2015 Tenor=9M

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	241	7.3948	0.2261	0.0146	7.0115	7.8093
Traded	183	7.418	0.214	0.0158	7.0115	7.8057
Diff (1-2)		-0.0232	0.221	0.0217		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		7.3948	7.3661	7.4235	0.2261	0.2075	0.2483
Traded		7.418	7.3868	7.4492	0.214	0.1941	0.2385
Diff (1-2)	Pooled	-0.0232	-0.0658	0.0194	0.221	0.207	0.2369
Diff (1-2)	Satterthwaite	-0.0232	-0.0654	0.0191			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	422.00	-1.07	0.29
Satterthwaite	Unequal	402.15	-1.08	0.28

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	240	182	1.12	0.4358

Year=2015 Tenor=1Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	241	7.4019	0.223	0.0144	7.0132	7.7711
Traded	232	7.4116	0.2191	0.0144	7.0132	7.7711
Diff (1-2)		-0.0097	0.2211	0.0203		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		7.4019	7.3736	7.4302	0.223	0.2047	0.2449
Traded		7.4116	7.3833	7.4399	0.2191	0.2008	0.2411
Diff (1-2)	Pooled	-0.0097	-0.0497	0.0303	0.2211	0.2078	0.2362
Diff (1-2)	Satterthwaite	-0.0097	-0.0496	0.0302			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	471.00	-0.48	0.63
Satterthwaite	Unequal	470.80	-0.48	0.63

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	240	231	1.04	0.7861

Year=2015 Tenor=2Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	241	7.1006	0.1758	0.0113	6.7463	7.38
Traded	214	7.1082	0.1759	0.012	6.7463	7.38
Diff (1-2)		-0.00761	0.1758	0.0165		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		7.1006	7.0783	7.1229	0.1758	0.1613	0.193
Traded		7.1082	7.0845	7.1319	0.1759	0.1606	0.1943
Diff (1-2)	Pooled	-0.00761	-0.0401	0.0248	0.1758	0.1651	0.1881
Diff (1-2)	Satterthwaite	-0.00761	-0.0401	0.0248			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	453.00	-0.46	0.65
Satterthwaite	Unequal	446.59	-0.46	0.65

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	213	240	1	0.9897

Year=2015 Tenor=3Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	241	7.0416	0.1554	0.01	6.7299	7.3388
Traded	154	7.0459	0.157	0.0126	6.7345	7.3388
Diff (1-2)		-0.00435	0.156	0.0161		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		7.0416	7.0219	7.0613	0.1554	0.1427	0.1707
Traded		7.0459	7.0209	7.0709	0.157	0.1412	0.1768
Diff (1-2)	Pooled	-0.00435	-0.036	0.0273	0.156	0.1458	0.1677
Diff (1-2)	Satterthwaite	-0.00435	-0.0361	0.0274			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	393.00	-0.27	0.79
Satterthwaite	Unequal	323.74	-0.27	0.79

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	153	240	1.02	0.8834

Year=2015 Tenor=4Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	241	7.0263	0.1549	0.00998	6.7272	7.338
Traded	120	7.0511	0.1555	0.0142	6.7321	7.338
Diff (1-2)		-0.0247	0.1551	0.0173		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		7.0263	7.0067	7.046	0.1549	0.1422	0.1701
Traded		7.0511	7.0229	7.0792	0.1555	0.138	0.1781
Diff (1-2)	Pooled	-0.0247	-0.0588	0.00936	0.1551	0.1445	0.1673
Diff (1-2)	Satterthwaite	-0.0247	-0.0589	0.00947			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	359.00	-1.43	0.15
Satterthwaite	Unequal	236.91	-1.42	0.16

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	119	240	1.01	0.9445

Year=2015 Tenor=5Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	241	7.0242	0.1519	0.00978	6.727	7.3383
Traded	239	7.0252	0.1521	0.00984	6.727	7.3383
Diff (1-2)		-0.00096	0.152	0.0139		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		7.0242	7.0049	7.0435	0.1519	0.1394	0.1668
Traded		7.0252	7.0058	7.0446	0.1521	0.1396	0.1671
Diff (1-2)	Pooled	-0.00096	-0.0282	0.0263	0.152	0.143	0.1623
Diff (1-2)	Satterthwaite	-0.00096	-0.0282	0.0263			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	478.00	-0.07	0.94
Satterthwaite	Unequal	477.95	-0.07	0.94

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	238	240	1	0.9803

ANNEXURE 2 B: T Test Results for Traded vs Method 2							
Year=2016 Tenor=6M							
Class	**N**	**Mean**	**Std Dev**	**Std Err**	**Minimum**	**Maximum**	
METHOD_2	240	6.5612	0.275	0.0178	5.9214	7.275	
Traded	181	6.5696	0.2709	0.0201	5.9214	7.0543	
Diff (1-2)		-0.00836	0.2733	0.0269			
Class	**Method**	**Mean**	**95% CL Mean**		**Std Dev**	**95% CL Std Dev**	
METHOD_2		6.5612	6.5263	6.5962	0.275	0.2524	0.3021
Traded		6.5696	6.5299	6.6093	0.2709	0.2456	0.3022
Diff (1-2)	**Pooled**	-0.00836	-0.0612	0.0445	0.2733	0.256	0.2931
Diff (1-2)	**Satterthwaite**	-0.00836	-0.0611	0.0444			
Method	**Variances**	**DF**	**t Value**	**Pr > |t|**			
Pooled	Equal	419.00	-0.31	0.76			
Satterthwaite	Unequal	390.73	-0.31	0.76			
Equality of Variances							
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**			
Folded F	239	180	1.03	0.8361			
Year=2016 Tenor=9M							
Class	**N**	**Mean**	**Std Dev**	**Std Err**	**Minimum**	**Maximum**	
METHOD_2	240	6.5735	0.2715	0.0175	5.9175	7.2174	
Traded	176	6.5996	0.2468	0.0186	5.9175	7.0462	
Diff (1-2)		-0.0262	0.2614	0.0259			
Class	**Method**	**Mean**	**95% CL Mean**		**Std Dev**	**95% CL Std Dev**	
METHOD_2		6.5735	6.539	6.608	0.2715	0.2492	0.2983
Traded		6.5996	6.5629	6.6364	0.2468	0.2234	0.2756
Diff (1-2)	**Pooled**	-0.0262	-0.0771	0.0248	0.2614	0.2447	0.2805
Diff (1-2)	**Satterthwaite**	-0.0262	-0.0764	0.0241			
Method	**Variances**	**DF**	**t Value**	**Pr > |t|**			
Pooled	Equal	414.00	-1.01	0.31			
Satterthwaite	Unequal	395.46	-1.02	0.31			
Equality of Variances							
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**			
Folded F	239	175	1.21	0.179			

Year=2016 Tenor=1Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	240	6.5816	0.2747	0.0177	5.9055	7.2447
Traded	225	6.5856	0.2664	0.0178	5.9055	7.065
Diff (1-2)		-0.00397	0.2707	0.0251		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		6.5816	6.5467	6.6165	0.2747	0.2522	0.3018
Traded		6.5856	6.5506	6.6206	0.2664	0.2438	0.2935
Diff (1-2)	Pooled	-0.00397	-0.0533	0.0454	0.2707	0.2543	0.2894
Diff (1-2)	Satterthwaite	-0.00397	-0.0533	0.0453			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	463.00	-0.16	0.87
Satterthwaite	Unequal	462.47	-0.16	0.87

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	239	224	1.06	0.639

Year=2016 Tenor=2Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	240	6.4287	0.2712	0.0175	5.7482	7.0565
Traded	201	6.4428	0.2623	0.0185	5.7482	7.0565
Diff (1-2)		-0.0141	0.2672	0.0255		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		6.4287	6.3942	6.4632	0.2712	0.2489	0.2979
Traded		6.4428	6.4063	6.4793	0.2623	0.2389	0.2908
Diff (1-2)	Pooled	-0.0141	-0.0643	0.0361	0.2672	0.2506	0.2861
Diff (1-2)	Satterthwaite	-0.0141	-0.0641	0.036			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	439.00	-0.55	0.58
Satterthwaite	Unequal	429.99	-0.55	0.58

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	239	200	1.07	0.6273

Year=2016 Tenor=3Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	240	6.4574	0.2571	0.0166	5.8353	6.8967
Traded	182	6.4396	0.2553	0.0189	5.8353	6.8967
Diff (1-2)		0.0178	0.2563	0.0252		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		6.4574	6.4247	6.4901	0.2571	0.236	0.2824
Traded		6.4396	6.4022	6.4769	0.2553	0.2315	0.2846
Diff (1-2)	Pooled	0.0178	-0.0317	0.0674	0.2563	0.2401	0.2749
Diff (1-2)	Satterthwaite	0.0178	-0.0317	0.0673			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	420.00	0.71	0.48
Satterthwaite	Unequal	391.26	0.71	0.48

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	239	181	1.01	0.9223

Year=2016 Tenor=4Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	240	6.5133	0.244	0.0158	5.8895	6.9358
Traded	145	6.4957	0.2413	0.02	5.8895	6.9056
Diff (1-2)		0.0177	0.243	0.0256		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		6.5133	6.4823	6.5444	0.244	0.224	0.2681
Traded		6.4957	6.4561	6.5353	0.2413	0.2164	0.2728
Diff (1-2)	Pooled	0.0177	-0.0326	0.0679	0.243	0.227	0.2615
Diff (1-2)	Satterthwaite	0.0177	-0.0325	0.0678			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	383.00	0.69	0.49
Satterthwaite	Unequal	306.44	0.69	0.49

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	239	144	1.02	0.8904

Year=2016 Tenor=5Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	240	6.5597	0.2208	0.0143	6.0414	6.9369
Traded	238	6.5578	0.2205	0.0143	6.0414	6.9369
Diff (1-2)		0.00186	0.2207	0.0202		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		6.5597	6.5316	6.5878	0.2208	0.2027	0.2426
Traded		6.5578	6.5297	6.586	0.2205	0.2023	0.2423
Diff (1-2)	Pooled	0.00186	-0.0378	0.0415	0.2207	0.2075	0.2356
Diff (1-2)	Satterthwaite	0.00186	-0.0378	0.0415			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	476.00	0.09	0.93
Satterthwaite	Unequal	475.98	0.09	0.93

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	239	237	1	0.9828

Annexure – 2 C: T Test Results for Traded vs Method 2

Year=2017 Tenor=6M

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	242	6.2099	0.1011	0.0065	6.0478	6.3767
Traded	174	6.2006	0.1007	0.00763	6.0478	6.3767
Diff (1-2)		0.00926	0.1009	0.01		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		6.2099	6.1971	6.2227	0.1011	0.0928	0.111
Traded		6.2006	6.1855	6.2157	0.1007	0.0911	0.1125
Diff (1-2)	Pooled	0.00926	-0.0105	0.029	0.1009	0.0945	0.1083
Diff (1-2)	Satterthwaite	0.00926	-0.0105	0.029			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	414.00	0.92	0.36
Satterthwaite	Unequal	373.68	0.92	0.36

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	241	173	1.01	0.9631

Year=2017 Tenor=9M

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	242	6.247	0.1091	0.00702	6.0603	6.44
Traded	186	6.2433	0.1107	0.00812	6.0603	6.44
Diff (1-2)		0.00365	0.1098	0.0107		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		6.247	6.2331	6.2608	0.1091	0.1002	0.1198
Traded		6.2433	6.2273	6.2593	0.1107	0.1005	0.1233
Diff (1-2)	Pooled	0.00365	-0.0174	0.0247	0.1098	0.1029	0.1177
Diff (1-2)	Satterthwaite	0.00365	-0.0174	0.0247			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	426.00	0.34	0.73
Satterthwaite	Unequal	395.27	0.34	0.73

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	185	241	1.03	0.8305

Year=2017 Tenor=1Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	242	6.2791	0.1284	0.00825	6.0789	6.5277
Traded	230	6.2777	0.1279	0.00843	6.0789	6.5277
Diff (1-2)		0.00145	0.1281	0.0118		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		6.2791	6.2629	6.2954	0.1284	0.1178	0.1409
Traded		6.2777	6.2611	6.2943	0.1279	0.1172	0.1408
Diff (1-2)	Pooled	0.00145	-0.0217	0.0246	0.1281	0.1204	0.1369
Diff (1-2)	Satterthwaite	0.00145	-0.0217	0.0246			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	470.00	0.12	0.90
Satterthwaite	Unequal	468.94	0.12	0.90

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	241	229	1.01	0.9592

Year=2017 Tenor=2Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	242	6.2062	0.1701	0.0109	5.9757	6.5346
Traded	232	6.2097	0.1708	0.0112	5.9757	6.5346
Diff (1-2)		-0.00352	0.1704	0.0157		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		6.2062	6.1846	6.2277	0.1701	0.1562	0.1868
Traded		6.2097	6.1876	6.2318	0.1708	0.1565	0.1879
Diff (1-2)	Pooled	-0.00352	-0.0343	0.0273	0.1704	0.1602	0.182
Diff (1-2)	Satterthwaite	-0.00352	-0.0343	0.0273			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	472.00	-0.22	0.82
Satterthwaite	Unequal	471.00	-0.22	0.82

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	231	241	1.01	0.9518

Year=2017 Tenor=3Y							
Class	**N**	**Mean**	**Std Dev**	**Std Err**	**Minimum**	**Maximum**	
METHOD_2	242	6.2736	0.1856	0.0119	6.0149	6.629	
Traded	228	6.2657	0.1821	0.0121	6.0149	6.629	
Diff (1-2)		0.00789	0.1839	0.017			
Class	**Method**	**Mean**	**95% CL Mean**		**Std Dev**	**95% CL Std Dev**	
METHOD_2		6.2736	6.2501	6.2971	0.1856	0.1704	0.2038
Traded		6.2657	6.2419	6.2895	0.1821	0.1668	0.2005
Diff (1-2)	**Pooled**	0.00789	-0.0255	0.0412	0.1839	0.1729	0.1965
Diff (1-2)	**Satterthwaite**	0.00789	-0.0254	0.0412			
Method	**Variances**	**DF**	**t Value**	**Pr > |t|**			
Pooled	Equal	468.00	0.46	0.64			
Satterthwaite	Unequal	467.24	0.47	0.64			
Equality of Variances							
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**			
Folded F	241	227	1.04	0.768			

Year=2017 Tenor=4Y							
Class	**N**	**Mean**	**Std Dev**	**Std Err**	**Minimum**	**Maximum**	
METHOD_2	242	6.359	0.1973	0.0127	6.0736	6.7279	
Traded	222	6.3594	0.1967	0.0132	6.0736	6.7279	
Diff (1-2)		-0.00036	0.197	0.0183			
Class	**Method**	**Mean**	**95% CL Mean**		**Std Dev**	**95% CL Std Dev**	
METHOD_2		6.359	6.334	6.384	0.1973	0.1812	0.2166
Traded		6.3594	6.3333	6.3854	0.1967	0.18	0.217
Diff (1-2)	**Pooled**	-0.00036	-0.0363	0.0356	0.197	0.1851	0.2106
Diff (1-2)	**Satterthwaite**	-0.00036	-0.0363	0.0356			
Method	**Variances**	**DF**	**t Value**	**Pr > |t|**			
Pooled	Equal	462.00	-0.02	0.98			
Satterthwaite	Unequal	458.79	-0.02	0.98			
Equality of Variances							
Method	**Num DF**	**Den DF**	**F Value**	**Pr > F**			
Folded F	241	221	1.01	0.9672			

Year=2017 Tenor=5Y

Class	N	Mean	Std Dev	Std Err	Minimum	Maximum
METHOD_2	242	6.4352	0.2088	0.0134	6.1174	6.8225
Traded	241	6.4341	0.2085	0.0134	6.1174	6.8225
Diff (1-2)		0.0011	0.2086	0.019		

Class	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
METHOD_2		6.4352	6.4088	6.4617	0.2088	0.1917	0.2292
Traded		6.4341	6.4077	6.4606	0.2085	0.1914	0.229
Diff (1-2)	Pooled	0.0011	-0.0362	0.0384	0.2086	0.1963	0.2227
Diff (1-2)	Satterthwaite	0.0011	-0.0362	0.0384			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	481.00	0.06	0.95
Satterthwaite	Unequal	481.00	0.06	0.95

Equality of Variances				
Method	Num DF	Den DF	F Value	Pr > F
Folded F	241	240	1	0.9842