

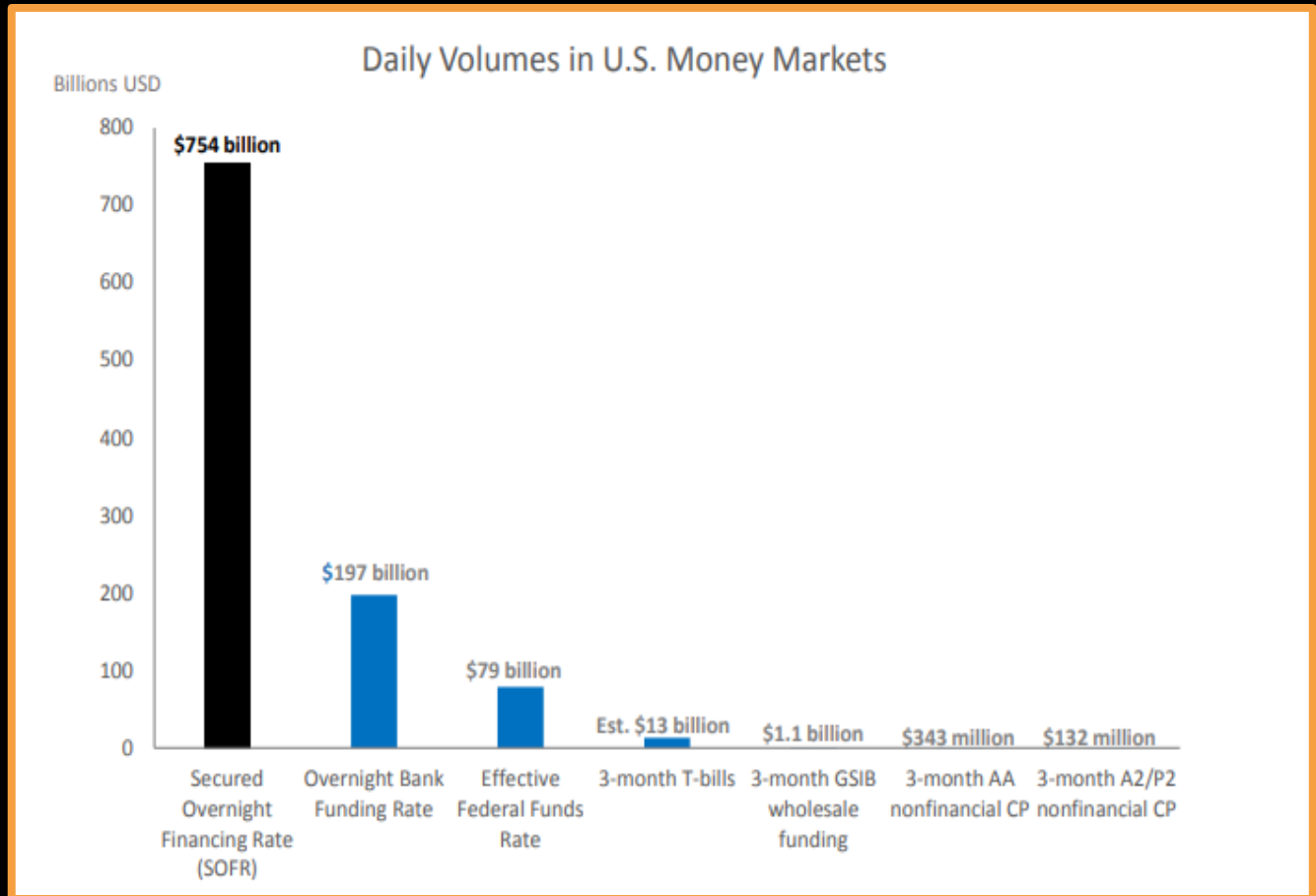
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Money Market Benchmarks Update

BBSW Changes and LIBOR transition

The New USD Reference Rate SOFR<GO>

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August & October 2017

AUD Repo Market & RBA Cash

Bloomberg

97) Settings Page 2/8 Contributor Pricing
 RESERVE BANK OF AUSTRALIA Australia Central Banks - Open Market Operations Last Update 11:08:16
 Reserve Bank of Australia

22:43 GMT
 07-Mar-19
 Page 1 of 1

OPEN MARKET OPERATIONS
 Results 08 March 2019
 1st Round

Transaction	Term (Days)	Value Dealt (\$m)	Weighted Avg (%)	Cut-off Rate (%)
Reverse Repo	14	300	1.740	1.65
	38	1530	2.037	2.02

Total (\$m)
 Outright Transactions (\$m)
 Same Day FX Swaps (\$m)
 Total Amount Dealt (\$m)



SOFR<GO>

Bloomberg

“The Secured Overnight Financing Rate (SOFR) is a broad measure of the cost of borrowing cash overnight collateralized by Treasury securities “

Based on Trade Data (IOSCO Principles)

The screenshot shows a Bloomberg help page for SOFR<GO>. At the top, there are navigation options: 'Live Help', 'Generate PDF', and 'Help on Secured Overnight Financing Rate'. Below this is a search bar with the text 'Search SOFR Content'. A list of search results is shown, with '1) About SOFR <GO>' selected. The main content area is titled 'Help on Secured Overnight Financing Rate' and contains the following text:

In an effort to transition derivatives and cash security markets away from their dependence upon LIBOR benchmarks to overnight (O/N) indices, central banks around the globe are overhauling these O/N indices. In the United States, the Federal Reserve Bank of New York began publishing several new O/N rates such as SOFR, TGCR, and BGCR on April 2, 2018. SOFR is expected to overtake the US Federal Funds Effective Rate index (FEDL01 Index) as the preferred O/N benchmark for OTC Overnight Index Swaps (OIS), for related exchange-traded futures and function as an alternative to USD LIBOR.

For more information on SOFR support and analytics: [SOFR Futures & Swaps on Bloomberg](#).

For more information on overnight index swaps: [OIS <GO>](#).

The Secured Overnight Financing Rate (SOFR) is a broad measure of the cost of borrowing cash overnight collateralized by Treasury securities. The SOFR includes all trades in the Broad General Collateral Rate, plus bilateral Treasury repurchase agreement (repo) transactions cleared through the Delivery-Versus-Payment (DVP) service offered by the Fixed Income Clearing Corporation (FICC), which is filtered to remove a portion of transactions considered "specials."

The SOFR is calculated as a volume-weighted median of transaction-level tri-party repo data collected from the Bank of New York Mellon (BNYM) as well as GCF Repo transaction data and data on bilateral Treasury repo transactions cleared through FICC's DVP service, which are

Stats Last Published 10/11/18 - Ver...

CME Futures on LIBOR, Fed Funds & SOFR

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Product	Code	Contract
Eurodollar Futures	GEZ9	DEC 2019
One-Month SOFR Futures	SR1Z8	DEC 2018
Three-Month SOFR Futures	SR3Z8	DEC 2018
10-Year T-Note Futures	ZNZ8	DEC 2018
Ultra 10-Year U.S. Treasury Note Futures	TNZ8	DEC 2018
30 Day Federal Funds Futures	ZQF9	JAN 2019
5-Year USD MAC Swap Futures	F1UZ8	DEC 2018
10-Year USD MAC Swap Futures	N1UZ8	DEC 2018

4 Unique USD STIR Contracts

1 X LIBOR

“EDA Comdty”

1 X Fed Funds

“FFA Comdty”

2 x SOFR

“SERA Comdty”

“SFRA Comdty”

And Term SOFR to Follow?

CME SOFR Futures

Bloomberg

SFRU8 Comdty 1) Actions 2) Settings

3 MONTH SOFR FUT As of **10/25/18**

7) CME | CEM » Contracts 20 Aggr Vol 10,919

4) Futures 5) Spreads 6) Strategies

Intraday Daily

8) Cur

Display Quoted Val Rate 9) Color Legend

Ticker	↑	Yest Settle	Volume	Open Int
21) SFRU8	Sep18	97.8100		1980
22) SFRZ8	Dec18	97.5750	2981	4297
23) SFRH9	Mar19	97.4100	331	1271
24) SFRM9	Jun19	97.2650	316	898
25) SFRU9	Sep19	97.1750	1930	640
26) SFRZ9	Dec19	97.1150	3275	1172
27) SFRH0	Mar20	97.0950	1788	761
28) SFRM0	Jun20	97.0950	234	1379
29) SFRU0	Sep20	97.1050	56	1249
30) SFRZ0	Dec20	97.1050	8	670
31) SFRH1	Mar21	97.1100		
32) SFRM1	Jun21			
33) SFRU1	Sep21			
34) SFRZ1	Dec21			

IMM Dated Basis Trading available between LIBOR & SOFR

EDU8 COMB Comdty 1) Actions 2) Settings

90DAY EURO\$ FUTR As of **10/25/18**

7) CME | CEM » Contracts 44 Aggr Vol 229,743

4) Futures 5) Spreads 6) Strategies

Intraday Daily

8) Cur

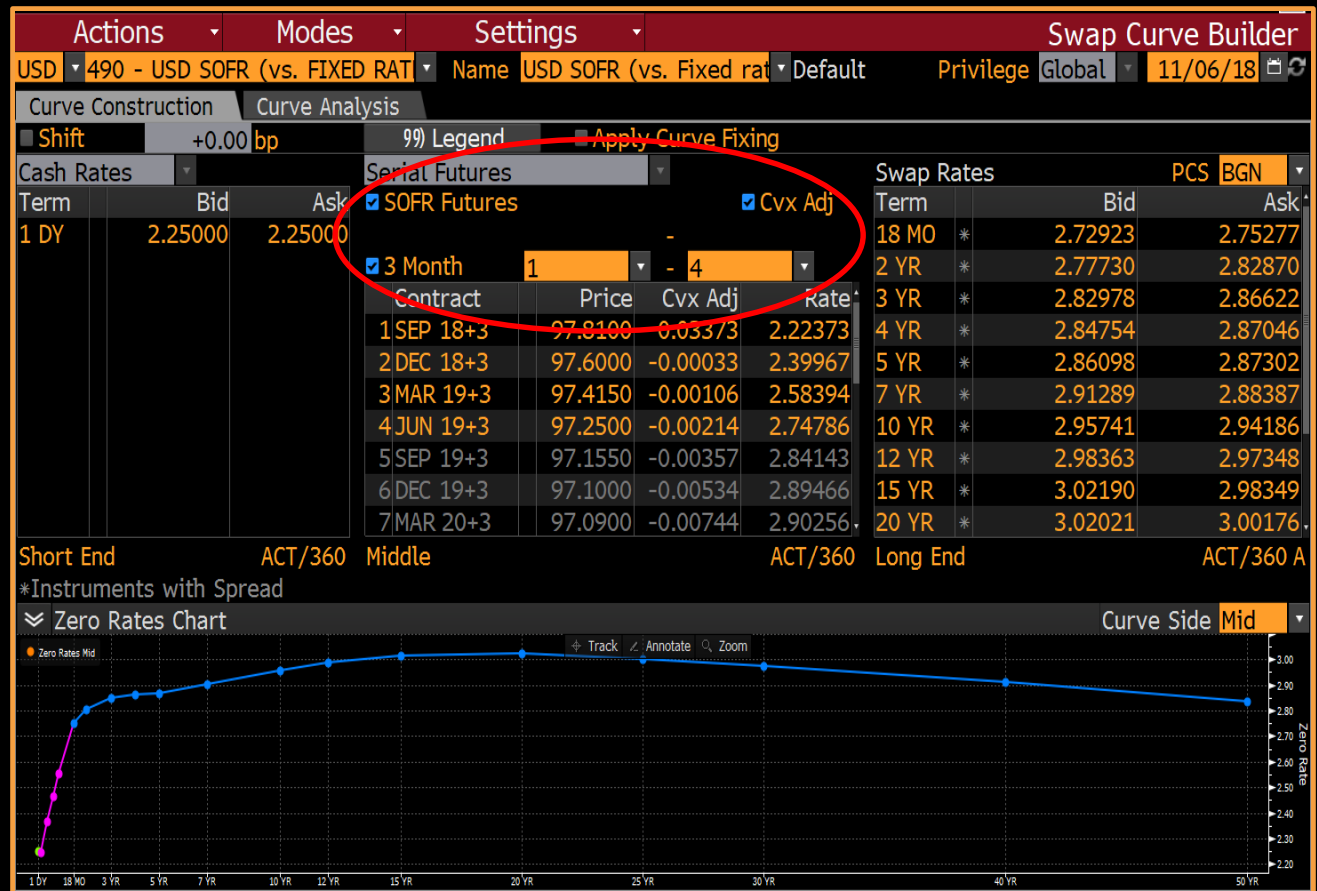
Display Quoted Val Rate 9) Color Legend

Ticker	↑	Yest Settle	Volume	Open Int
21) EDX8	Nov18	97.3575	1498	235669
22) EDZ8	Dec18	97.250	16966	1774703
23) EDF9	Jan19	97.210	65	60200
24) EDG9	Feb19	97.165	4138	14249
25) EDH9	Mar19	97.110	15393	1381746
26) EDJ9	Apr19	97.075	381	2001
27) EDM9	Jun19	96.970	16217	1336632
28) EDU9	Sep19	96.875	27149	1393839
29) EDZ9	Dec19	96.810	35157	2010456
30) EDH0	Mar20	96.800	16780	956316
31) EDM0	Jun20	96.805	13701	956001
32) EDU0	Sep20	96.815	23819	917968
33) EDZ0	Dec20	96.815	13543	1175480
34) EDH1	Mar21	96.825	17770	523941

ICVS<GO> for SOFR

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Evolving as Market develops
Both Monthly & 3 Month IMM Futures allowed
Need enhance DCM Tools to access SOFR pricing



Bank Bill Volumes

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Bank Bill Swap Rates (BBSW)



Aggregate daily eligible volume in Prime Bank paper executed or reported through approved venues

A\$ millions

Note: ASX implemented a transactional based Volume Weighted Average Price (VWAP) BBSW methodology on 21st May 2018. The data below is published one week in arrears and represents all eligible volume transacted during the rate set window (8:30am-10:00am) and reported to the ASX via an approved venue. Eligible volume does not represent the aggregate of all trading in Prime Bank paper that occurs throughout the day. For more information visit asx.com.au/services/benchmark.htm

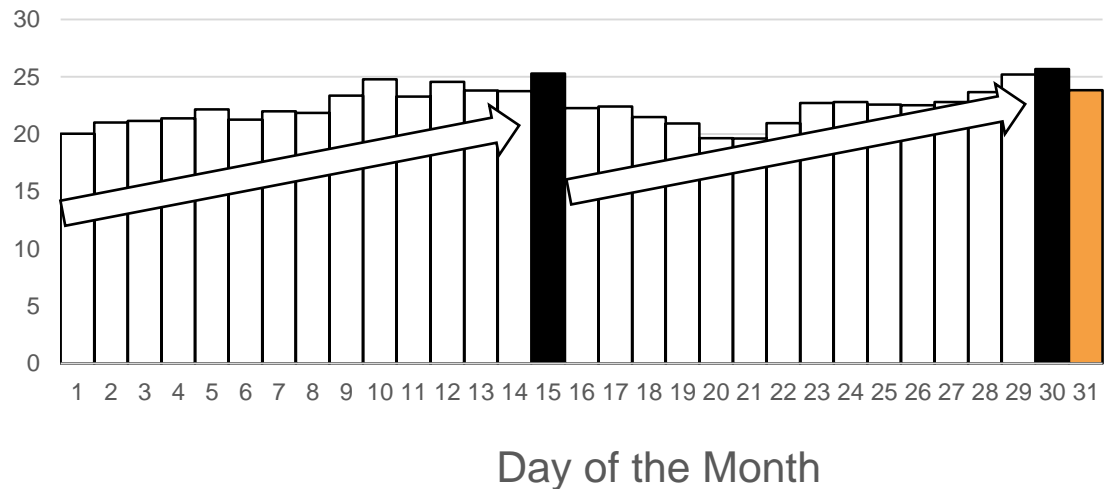
Date	1 Month	2 Month	3 Month	4 Month	5 Month	6 Month	Total Volume
2/21/2019	65	100	225			349	739
2/22/2019	202	122	868	60	135	1,172	2,559
2/25/2019	282	180	220	73	32	540	1,327
2/26/2019	448	200	370		180	1,061	2,259
2/27/2019	479	88	65	125	25	812	1,594
2/28/2019	703	80	638	15	50	90	1,576
3/1/2019	355	110	412	80		306	1,263

BBSW Changes

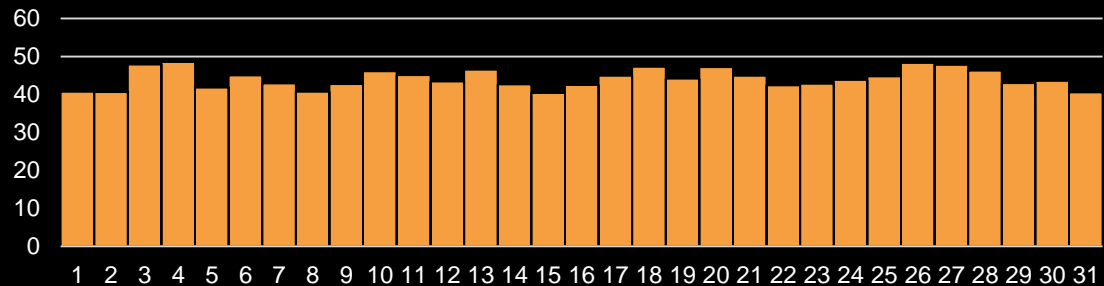
VWAP & Constant Tenor, (+- 5Days)
No Earlies Lates!

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Average AUD 3 Month BBSW vs OIS 2004 - 2014



Average AUD 3 Month BOB 2018



RBA Repo now volatile

(Relatively!)

Bloomberg

Bloomberg
RBA Repo

Page		
14 9 2		

Swaps Toolkit		
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Date		
3	29-Oct-18	29 Oct

Page	Term (Days)		Value Dealt (AUD Millions)	Weighted Average (%)	Cut-off Rate (%)	OIS Equivalent	Repo Vs OIS (Bps)
8	15	15	460	2.0400	2.030	1.4980	54.198
9	31	31	194	2.0560	2.050	1.4975	55.850

Curve Toolkit							
Date							
29-Oct-18			AUD.OIS:BLOOMBERG DC 8939				
Term (Days)			Value Dealt (AUD Millions)	Weighted Average (%)	Cut-off Rate (%)	OIS Equivalent	Repo Vs OIS (Bps)
15			460	2.0400	2.030	1.4981	54.188
31			194	2.0560	2.050	1.4975	55.850

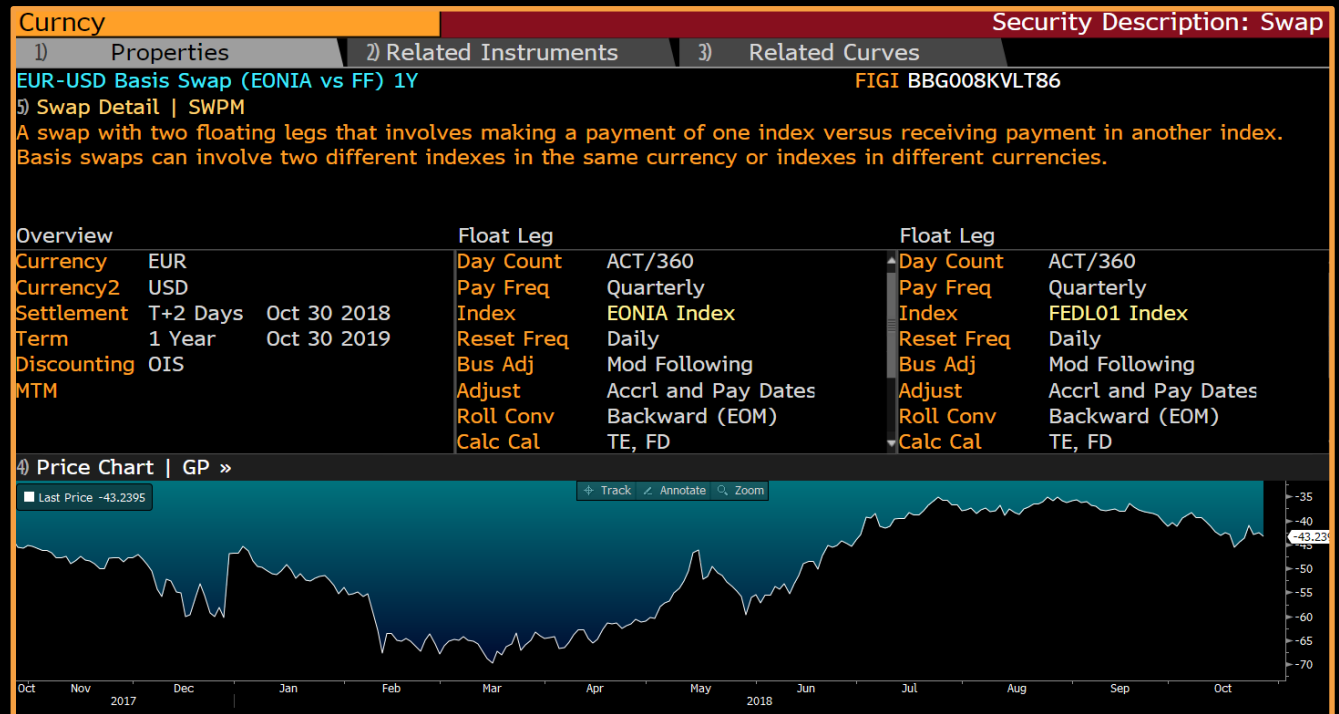
RBA<GO> Analogue Page							
OPEN MARKET OPERATIONS		29 October 2018		Page 1 of 1			
Reverse Repo	15	460	2.040	2.03			
	31	1943	2.056	2.05			
22:41 GMT							

Cut-off Rate (%)	OIS Equivalent	Repo Vs OIS (Bps)
2.030	1.4980	54.198
2.050	1.4975	55.850

OIS OIS Basis Swaps

DES<GO>

Bloomberg



OIS OIS XCCY Basis
Natural Hedge for Central Desk

The Future of AUD USD XCCY Basis Swaps

Bloomberg

1) Update 2) Copy 4) Actions 5) Share Custom Expression Editor
 Ticker: .EUUSO1 Index Name: EUR USD OIS IMPLIED BASIS 1Y CIX Price Snapshot: -44.45
 Use +,-,*,/ as operators. ? for field picker. ! to nest a CIX.
 EUBS1 Curncy - USBG1 Curncy + E0BSVC1 Curncy

Examples

The mean of the price of Google and Facebook
 $(GOOG \text{ US Equity} + FB \text{ US Equity}) / 2$

$ASKPRC[VOD \text{ LN Equity}] - BIDPRC[VOD \text{ LN Equity}]$

Log Base e of the yield of a 10 year bond
 $2.30258509 + LOG(YIELD[CT10 \text{ Govt}])$

Preview Chart 10/26/17 - 10/26/18
 ■ .EUUSO1 Index -44.45

Could Back fill data in AUD?

Most Likely we generate arbitrage free data using SWPM<GO> (STK in Excel)



FRN Market has started! SRCH<GO>

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Fixed Income Search

Build/Edit Search | My Searches | Example Searches

Build with Criterion | Build by Merging Saved Searches

As of 10/31/2018

1. Select Universe

11) Asset Classes Corporates, Governments, Certificates (Consolidate Duplicate Bonds) 10,121,355 securities

12) Sources All Securities

2. Criteria Ask a Question

	Field	Boundaries	Selected Criteria	Matches
31)	Security Status	<input checked="" type="checkbox"/> Include	Bonds: Active	1,722,930
32) And	Floating Rate Benchmar...	<input checked="" type="checkbox"/> Include	(Secured Overnight Financing Rate (SOFR) or Eoni...	51
33) And	Issue Date	<input checked="" type="checkbox"/> Greater than	01/01/2018	36
34) And			Fields	

36 securities 1) Results

Fixed Income Search: Results

Unsaved Search > Issue Date by Curr (Sum of Amount Issued in MM)

Currency AUD (As of Issue Date)

Results | Matrix | Rank | Holders Matrix | Holders

24) Edit Matrix

Issue Date	Total	EUR	USD	GBP
1) Total	87,155	52,487	23,636	11,031
2) 2018	36,350	2,179	23,636	10,535
3) 2017	3,096	3,096	--	--
4) 2016	15	15	--	--
5) 2015	1,675	1,675	--	--
6) 2014	4,776	4,776	--	--
7) 2013	6,565	6,565	--	--
8) 2012	4,662	4,662	--	--
9) 2011	4,560	4,560	--	--
10) 2010	5,672	5,176	--	--
11) 2009	1,038	1,038	--	--
12) 2008	6,684	6,684	--	--
13) 2007	6,481	6,481	--	--
14) 2006	676	676	--	--
15) 2005	1,265	1,265	--	--
16) 2004	993	993	--	--
17) 2003	1,210	1,210	--	--
18) 2000	568	568	--	--
19) 1999	868	868	--	--

Rows: Issue Date

Frequency: Yearly

Continuous Dates

Columns: Curr (497)

Column Values: Top 20 Custom Select

Cell is Sum of Amt Issued (MM)

OIS FRN Coupons DES<GO>

How to avoid interest payment delays as used on OIS?

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IBRD Float 08/21/20 Corp		Settings	Page 1/12 Security Description: Bond			
25 Bond Description		26 Issuer Description		94 Notes	95 Buy	96 Sell
Pages	Issuer Information	Identifiers				
11) Bond Info	Name INTL BK RECON & DEVELOP	ID Number	AU0467335			
12) Addtl Info	Industry Supranationals	CUSIP	459058GK3			
13) Reg/Tax	Security Information	ISIN	US459058GK33			
14) Covenants	Mkt Iss Global	Bond Ratings				
15) Guarantors	Country SNAT	Currency USD	Moody's	Aaa		
16) Bond Ratings	Rank Sr Unsecured	Series GDIF	S&P	AAA		
17) Identifiers	Coupon 0/N SOFR +22.0000	Type Floating	Composite	AAA		
18) Exchanges	Formula 0/N SOFR +22.0000	Issuance & Trading				
19) Inv Parties	Day Cnt ACT/360	Iss Price 100.00000	Amt Issued/Outstanding			
20) Fees, Restrict	Maturity 08/21/2020	AMT Issued/Outstanding				
21) Schedules	BULLET	USD	1,000,000.00 (M) /			
22) Coupons	Iss Sprd	USD	1,000,000.00 (M)			
Quick Links	Calc Type (21)FLOAT RATE NOTE	Pricing Date	1,000.00 / 1,000.00			
32) ALLQ Pricing	Interest Accrual Date	08/14/2018		Min Piece/Increment		
33) QRD Qt Recap	1st Settle Date	08/21/2018		Par Amount 1,000.00		
34) TDH Trade Hist	1st Coupon Date	11/21/2018		Book Runner CITI,TDSEC		
35) CACS Corp Action				Exchange Multiple		
36) CF Prospectus						
37) CN Sec News						
38) HDS Holders						
66) Send Bond						

IBRD Float 08/21/20 Corp		Settings	Page 12/12 Security Description: Bond			
25 Bond Description		26 Issuer Description		94 Notes	95 Buy	96 Sell
Pages	Coupons	Coupon Information				
11) Bond Info	Benchmark SOFRRATE	Benchmark Freq	0/N			
12) Addtl Info	Fix Frequency Daily	Next Coupon Date	11/21/2018			
13) Reg/Tax	Paying Agent	Prev Coupon Date	08/21/2018			
14) Covenants	Pay Calendars US EN	Cap	Floor 0			
15) Guarantors	Refix Calendars FD	Margin +22	Reset Days Prior	1		
16) Bond Ratings	First Irreg Cpn Normal	Current Coupon	Lockout	4		
17) Identifiers	Last Irreg Cpn Normal	Cpn Conv Mod-Adj N...	Cpn Freq	Quarterly		
18) Exchanges						
19) Inv Parties						
20) Fees, Restrict						
21) Schedules						
22) Coupons	<input checked="" type="radio"/> Table View	<input type="radio"/> Chart View				
Quick Links	Past Coupon Resets		Margin History			
32) ALLQ Pricing	Accrual Start	Rate	Date	Margin		
33) QRD Qt Recap	11/01/2018					
34) TDH Trade Hist	10/31/2018	2.40000				
35) CACS Corp Action	10/30/2018	2.40000				
36) CF Prospectus	10/27/2018	2.41000				
37) CN Sec News	10/26/2018	2.41000				
38) HDS Holders	10/25/2018	2.40000				
66) Send Bond	10/24/2018	2.39000				

