

## **General**

Bloomberg has provided graphs that roughly illustrate the four approaches to adjusted RFRs and three spread adjustment methodologies described in Annexes A and B, respectively, to the ISDA July 2018 Consultation. The graphs cover U.S. dollar (SOFR), Canadian dollar (CORRA) and Hong Kong dollar (HONIA).

The graphs roughly illustrate the following subset of possible adjusted RFR and spread adjustment pairs:

- Compounded Setting in Arrears Rate with Forward Approach
- Compounded Setting in Arrears Rate with Historical Mean/Median Approach
- Spot Overnight Rate with Spot-Spread Approach
- *For comparative purposes only:* Compounded Setting in Arrears Rate with Spot-Spread Approach

This subset of all possible pairs should provide respondents with information to analyze the remaining possible pairs.

*Please note that the examples below are rough illustrations for informational purposes. Actual build out and implementation of the selected approach may yield different values. However, the graphs below should provide a good sense of how the approaches would function.*

## **Additional Notes Regarding SOFR Data**

### **Official SOFR percentiles and accompanying volumes**

The Secured Overnight Financing Rate (SOFR) is a broad measure of the cost of borrowing cash overnight collateralized by Treasury securities. SOFR is calculated as a volume-weighted median of transaction-level tri-party repurchase (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 (filtered to remove a portion of transactions considered “specials”) cleared through the Fixed Income Clearing Corporation's Delivery-versus-Payment service. The GCF repo data and bilateral Treasury repo data are obtained from DTCC Solutions LLC, an affiliate of the Depository Trust & Clearing Corporation.

On a Bloomberg terminal press: {SOFR<GO>} and {SOFRRATE Index Des <GO>}

New York Fed Landing Page for SOFR: [Secured Overnight Financing Rate](#)

Dates used for these graphs: April 2, 2018 to March 21, 2019

New York Fed Data Excel®: [Secured Overnight Financing Rate data](#)

*Use of the Secured Overnight Financing Rate is subject to important disclaimers, limitations and indemnification obligations. See the New York Fed's [Terms of Use](#). The New York Fed has no liability for publication of the rate on its webpage or in any other sources.*

### **Indicative SOFR and accompanying volumes**

The New York Fed released indicative historical rates for SOFR prior to official publication of SOFR in April 2018. These indicative, historical data only extended back to August 2014 due to data availability issues prior to that date.

On a Bloomberg terminal press: {.SOFRHIST G Index HP<GO>} (for indicative SOFR history)

New York Fed Statement Landing Page: [FRBNY Statement Introducing the Treasury Repo Reference Rates](#)

Dates used for these graphs: August 25, 2014 to April 1, 2018

New York Fed Data Excel: [Indicative historical SOFR data](#)

### **Overnight Treasury GC Repo Primary Dealer Survey Rate (%)**

Since the late 1990s, the Open Market Trading Desk at the New York Fed has conducted a survey of primary dealers each morning covering their borrowing activity in the Treasury general collateral repurchase (repo) market on that day. On March 9, 2018, the New York Fed released a time series of the volume-weighted mean rate of the primary dealers' overnight Treasury general collateral repo borrowing activity collected through the survey (the survey rate).

It is important to note that there are a number of technical differences between the survey rate and SOFR. The survey rate is calculated as a volume-weighted mean, whereas as SOFR is calculated as a volume-weighted median of transaction-level data. In addition, the transactions underlying the survey rate are not as broad as those underlying SOFR; the survey collects only the general collateral segments of the repo market and does not capture borrowing activity conducted by non-primary dealer market participants. Nonetheless, the survey rate can play an

important role in providing insight into how a broad measure of repo market activity would have behaved over a significantly longer time.

Not Available on the Bloomberg terminal.

New York Fed Statement Landing Page: [FRBNY Statement Regarding the Publication of Historical Repo Rate Data](#)

Dates used for these graphs: June 7, 2000 to August 24, 2014

New York Fed Data Excel: [FRBNY Overnight Treasury General Collateral Repo Primary Dealer Survey Rate](#)

## **Contents**

### **Adjusted RFRs**

- Graphs 1 through 6 illustrate the full history of  $SOR_f$ ,  $COR_f$ ,  $ARR_f$ , and  $ADR_f$  for the 1-month and 6-month tenors.
- For a more detailed view, the full history for each currency is broken into five shorter periods in graphs 7 through 12.

### **Spread Adjustments**

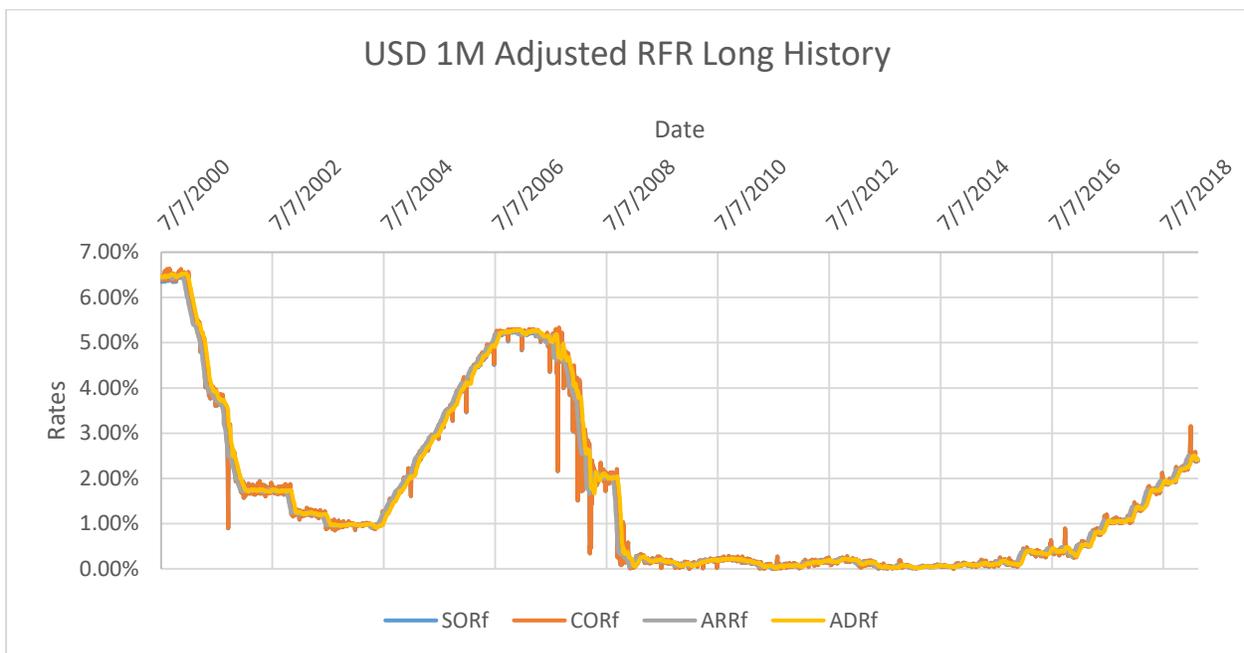
- Graphs 13 through 24 illustrate the forwards computed from the IBOR swap and RFR swap curves and their spreads, in several IBOR tenors.
- Graphs 25 through 36 illustrate an average (mean) spread over the past five years for the 1-month and 6-month IBOR tenors, with linear interpolation/extrapolation over the next year (i.e., the "transitional period"), and beyond that, constant extrapolation to the mean. These are all based on the compounded setting in arrears rate.
- Graphs 37 through 60 illustrate the spot-spread approach over the past five years, based upon 10-day, 5-day, and 1-day (i.e., "spot") moving averages. Graphs 37 through 48 are based on the spot overnight rate. Graphs 38 through 60 are based on the compounded setting in arrears rate.

**Adjusted RFRs**

Graphs 1 through 6 illustrate the full history of SORf, CORf, ARRf, and ADRf for the 1-month and 6-month tenors.

**Graph 1**

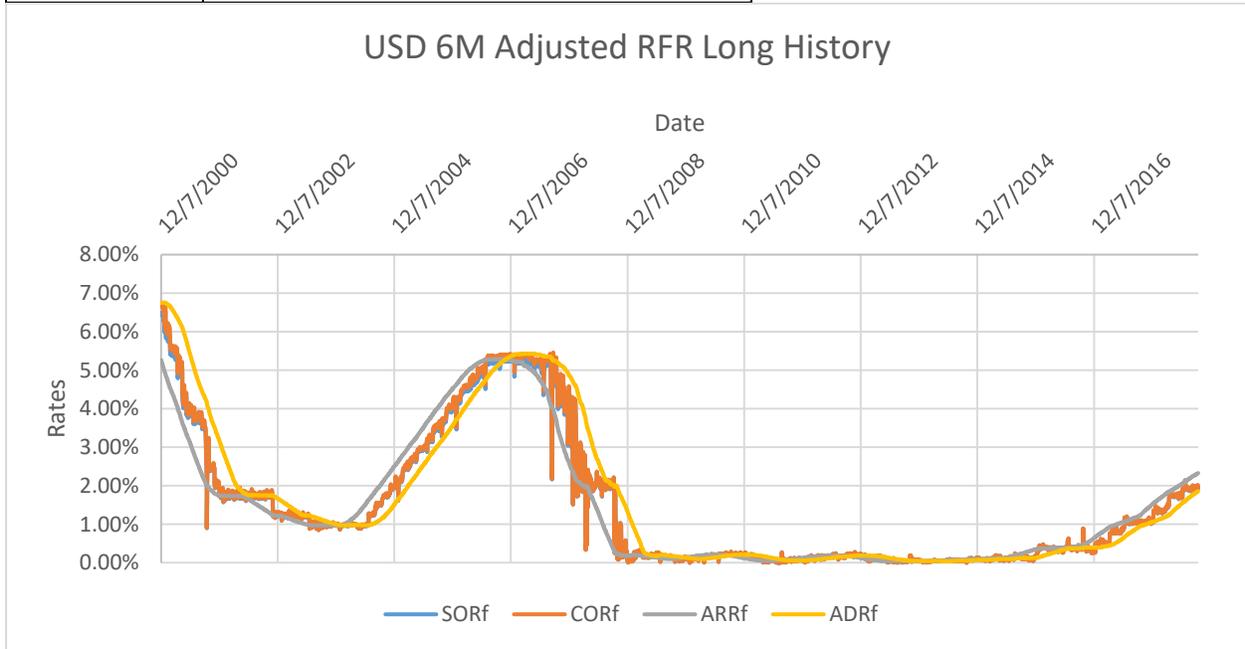
	SORf	CORf	ARRf	ADRf
MIN	0.00%	0.00%	0.01%	0.01%
MAX	6.60%	6.64%	6.49%	6.53%
AVERAGE	1.61%	1.61%	1.60%	1.60%
ST DEV	1.870%	1.879%	1.852%	1.865%



Source: Bloomberg Finance L.P.

**Graph 2**

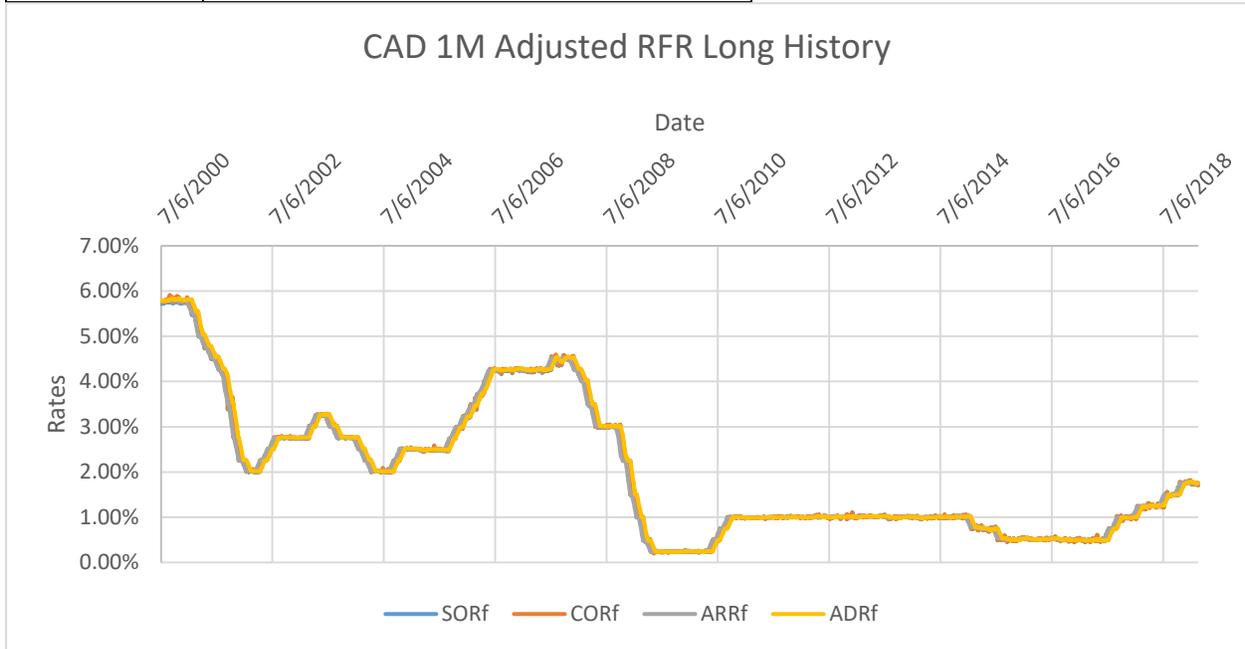
	SORf	CORf	ARRf	ADRf
MIN	0.00%	0.00%	0.04%	0.04%
MAX	6.60%	6.82%	6.54%	6.76%
AVERAGE	1.61%	1.64%	1.56%	1.58%
ST DEV	1.870%	1.922%	1.781%	1.847%



**Source: Bloomberg Finance L.P.**

**Graph 3**

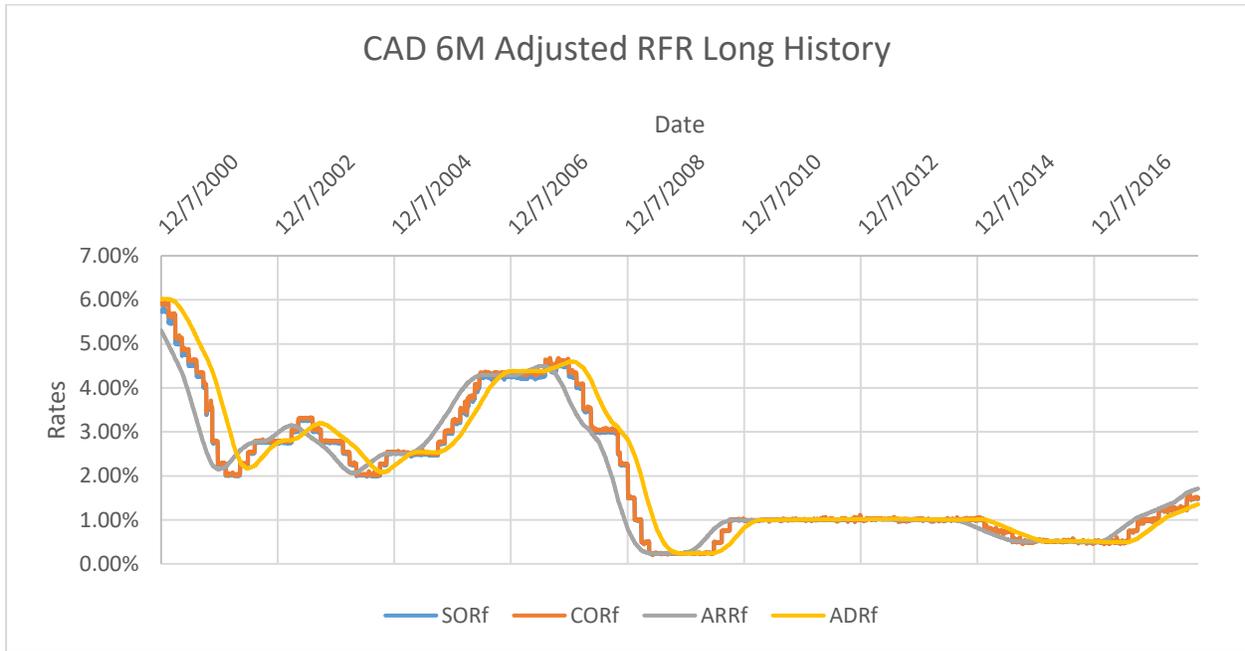
	SORf	CORf	ARRf	ADRf
MIN	0.20%	0.20%	0.23%	0.23%
MAX	5.88%	5.91%	5.80%	5.83%
AVERAGE	2.03%	2.03%	2.02%	2.03%
ST DEV	1.520%	1.526%	1.512%	1.522%



**Source: Bloomberg Finance L.P.**

**Graph 4**

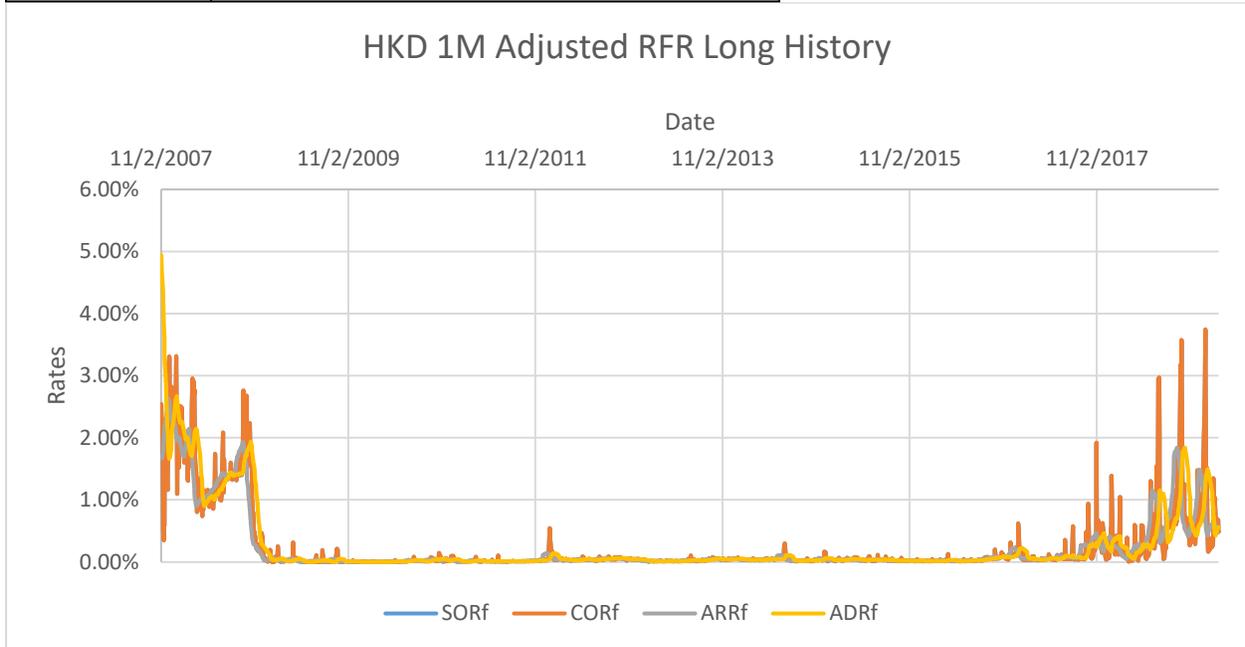
	SORf	CORf	ARRf	ADRf
MIN	0.20%	0.20%	0.24%	0.24%
MAX	5.88%	6.06%	5.85%	6.02%
AVERAGE	2.03%	2.06%	1.99%	2.03%
ST DEV	1.519%	1.559%	1.457%	1.512%



**Source: Bloomberg Finance L.P.**

**Graph 5**

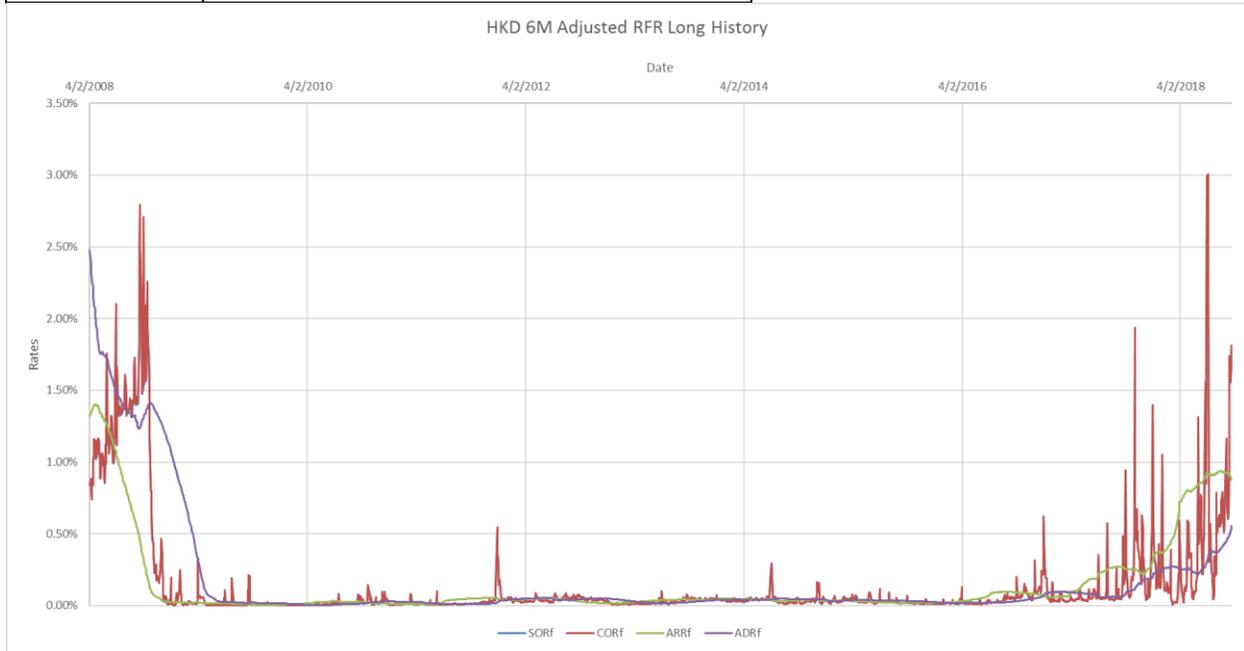
	SORf	CORf	ARRf	ADRf
MIN	0.00%	0.00%	0.00%	0.00%
MAX	5.70%	5.73%	4.92%	4.94%
AVERAGE	0.27%	0.27%	0.26%	0.26%
ST DEV	0.656%	0.659%	0.554%	0.558%



**Source: Bloomberg Finance L.P.**

**Graph 6**

	SORf	CORf	ARRf	ADRf
MIN	0.00%	0.00%	0.00%	0.00%
MAX	5.70%	5.87%	2.45%	2.48%
AVERAGE	0.27%	0.25%	0.21%	0.18%
ST DEV	0.656%	0.658%	0.407%	0.393%



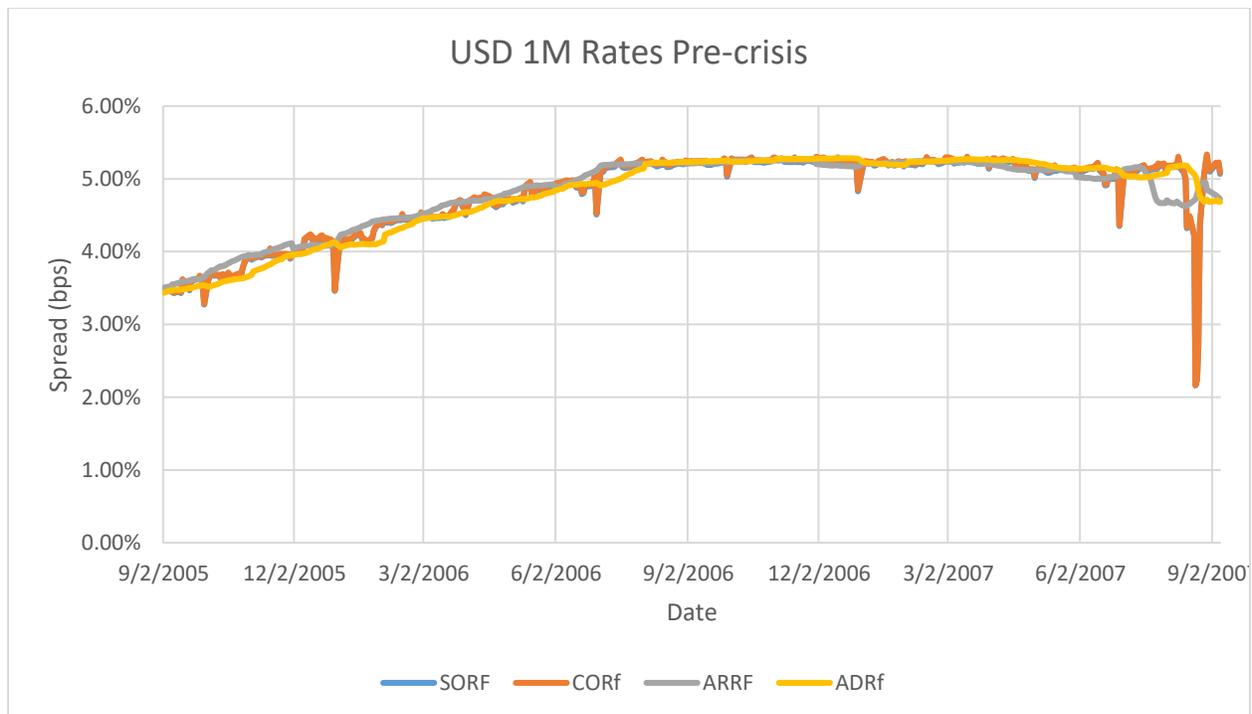
**Source: Bloomberg Finance L.P.**

For a more detailed view, the full history for each currency is broken into five shorter periods in graphs 7 through 12.

**1-month USD (SOFR)**

**Graph 7-A**

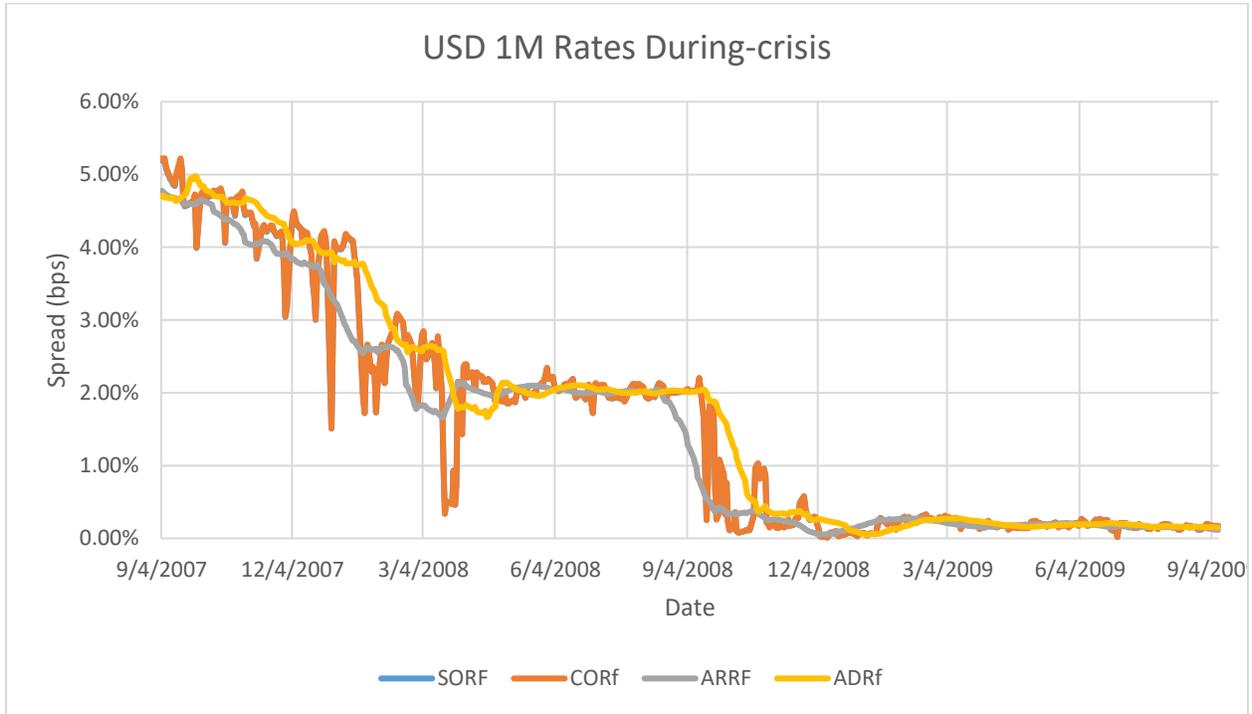
	SORf	CORf	ARRf	ADRf
MIN	2.16%	2.16%	3.50%	3.43%
MAX	5.31%	5.34%	5.26%	5.28%
AVERAGE	4.79%	4.81%	4.82%	4.79%
ST DEV	0.5639%	0.5682%	0.4897%	0.5631%



**Source: Bloomberg Finance L.P.**

**Graph 7-B**

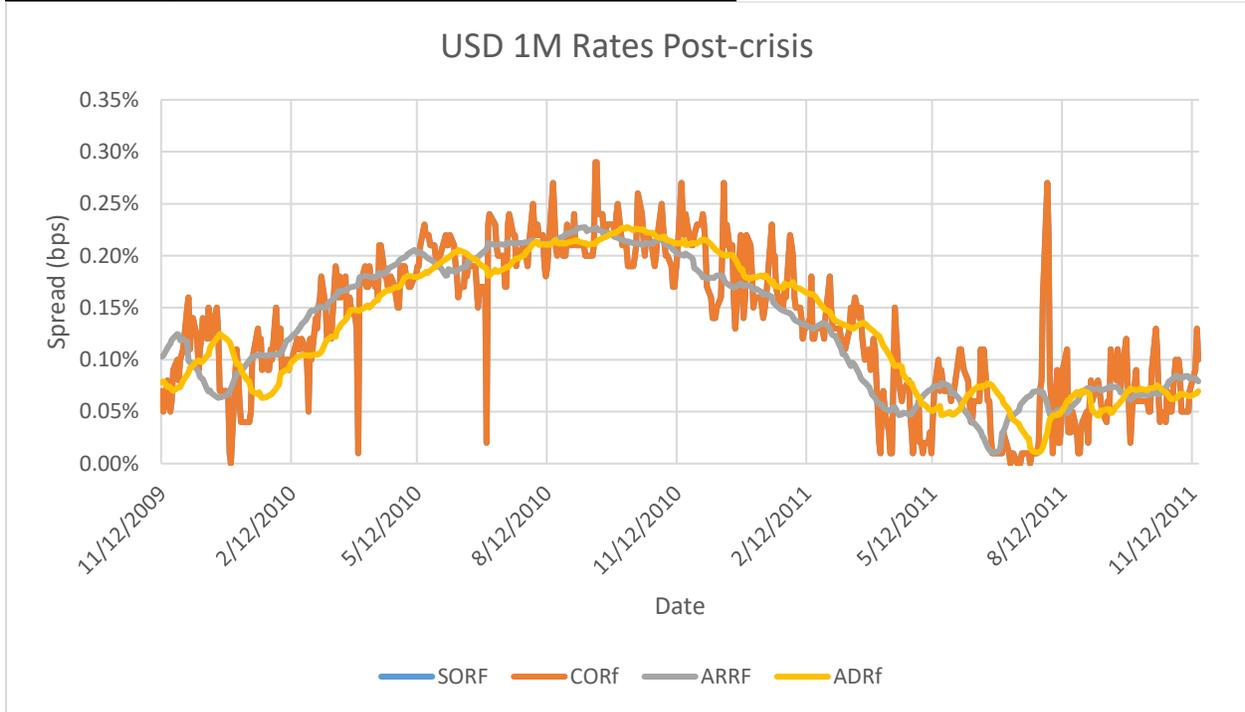
	SORf	CORf	ARRf	ADRf
MIN	0.01%	0.01%	0.05%	0.05%
MAX	5.20%	5.22%	4.78%	4.98%
AVERAGE	1.60%	1.60%	1.51%	1.70%
ST DEV	1.5811%	1.5871%	1.4797%	1.5915%



**Source: Bloomberg Finance L.P.**

**Graph 7-C**

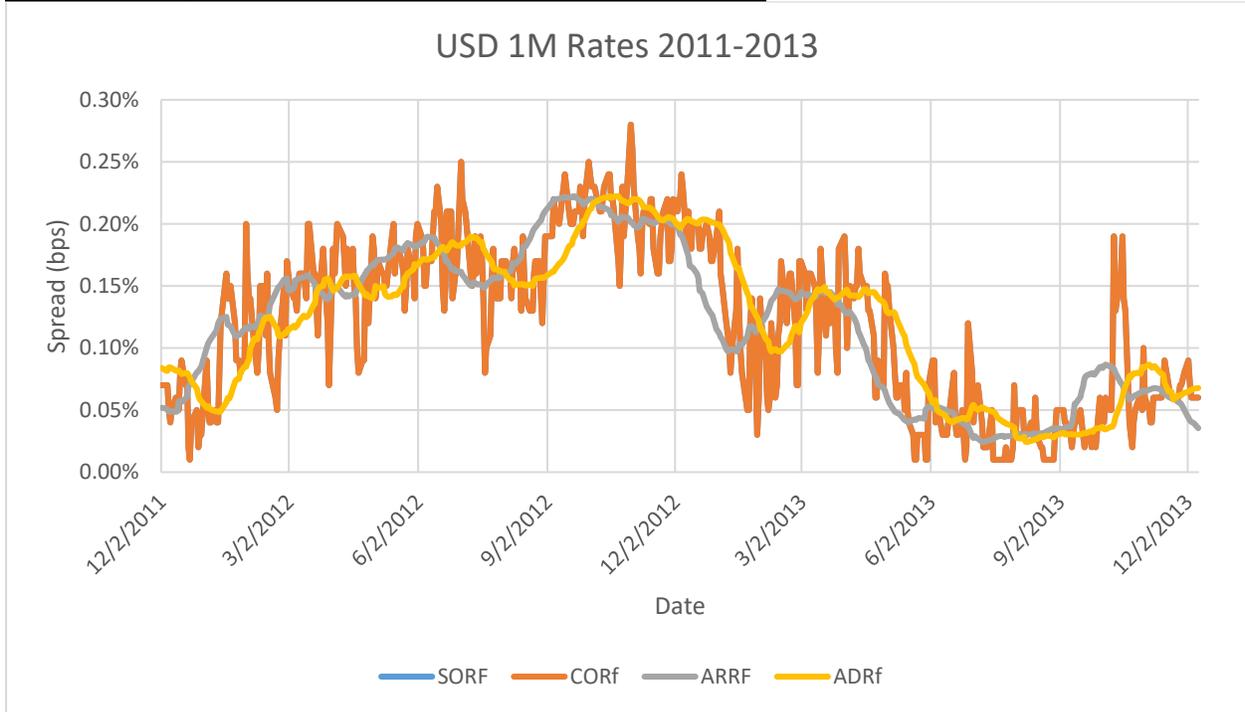
	SORf	CORf	ARRf	ADRf
MIN	0.00%	0.00%	0.01%	0.01%
MAX	0.29%	0.29%	0.23%	0.23%
AVERAGE	0.13%	0.13%	0.13%	0.13%
ST DEV	0.0708%	0.0708%	0.0633%	0.0631%



**Source: Bloomberg Finance L.P.**

**Graph 7-D**

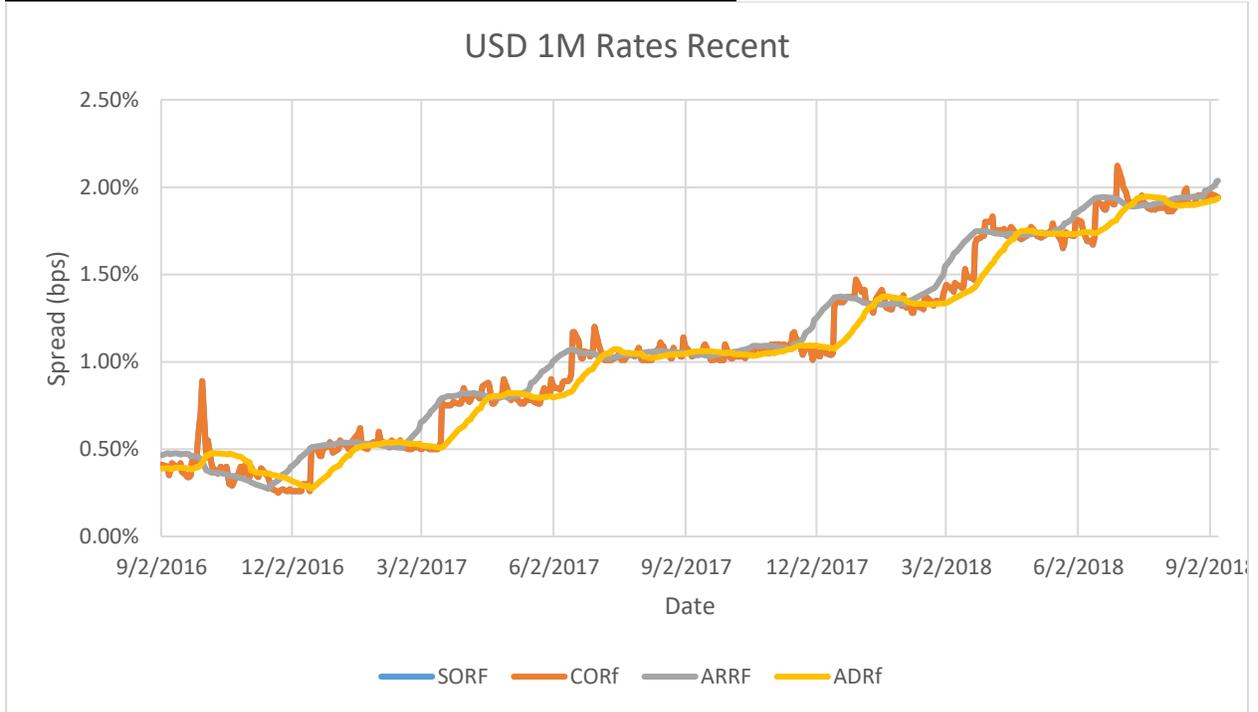
	SORf	CORf	ARRf	ADRf
MIN	0.01%	0.01%	0.02%	0.02%
MAX	0.28%	0.28%	0.22%	0.22%
AVERAGE	0.12%	0.12%	0.12%	0.12%
ST DEV	0.0664%	0.0665%	0.0596%	0.0586%



**Source: Bloomberg Finance L.P.**

**Graph 7-E**

	SORf	CORf	ARRf	ADRf
MIN	0.25%	0.25%	0.27%	0.27%
MAX	2.12%	2.12%	2.04%	1.95%
AVERAGE	1.09%	1.09%	1.12%	1.06%
ST DEV	0.5151%	0.5161%	0.5169%	0.5060%

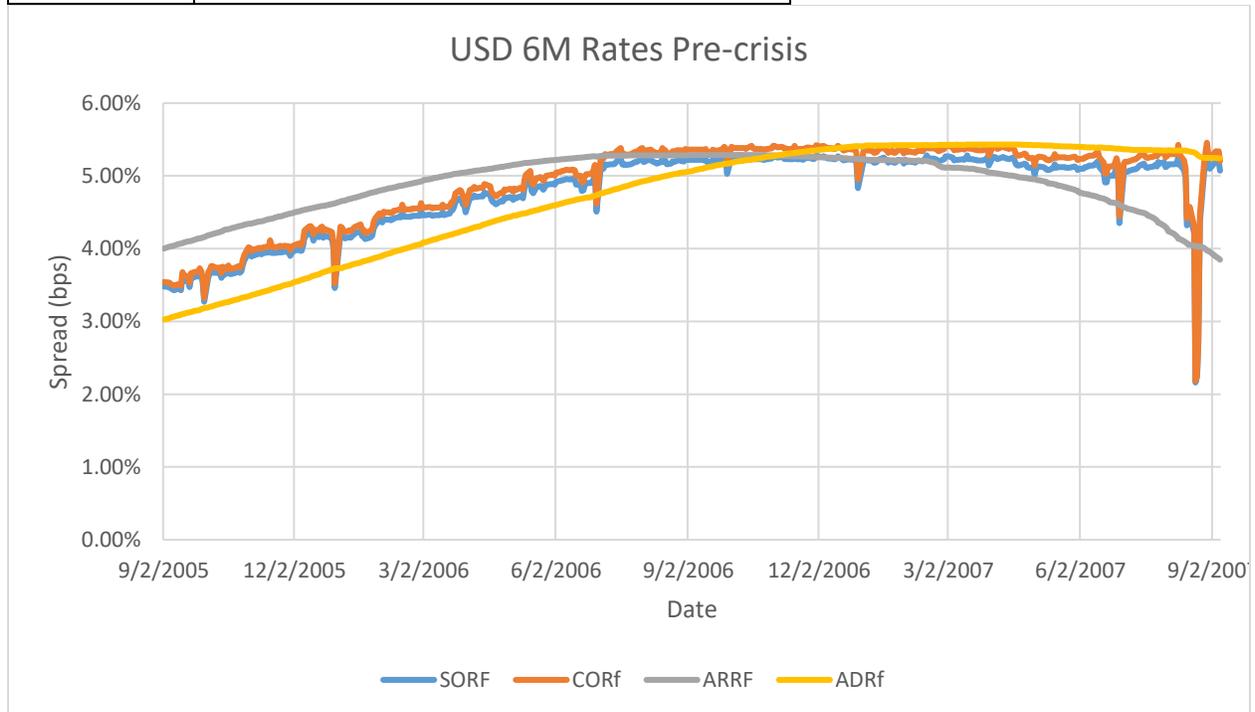


**Source: Bloomberg Finance L.P.**

## 6-month USD (SOFR)

Graph 8-A

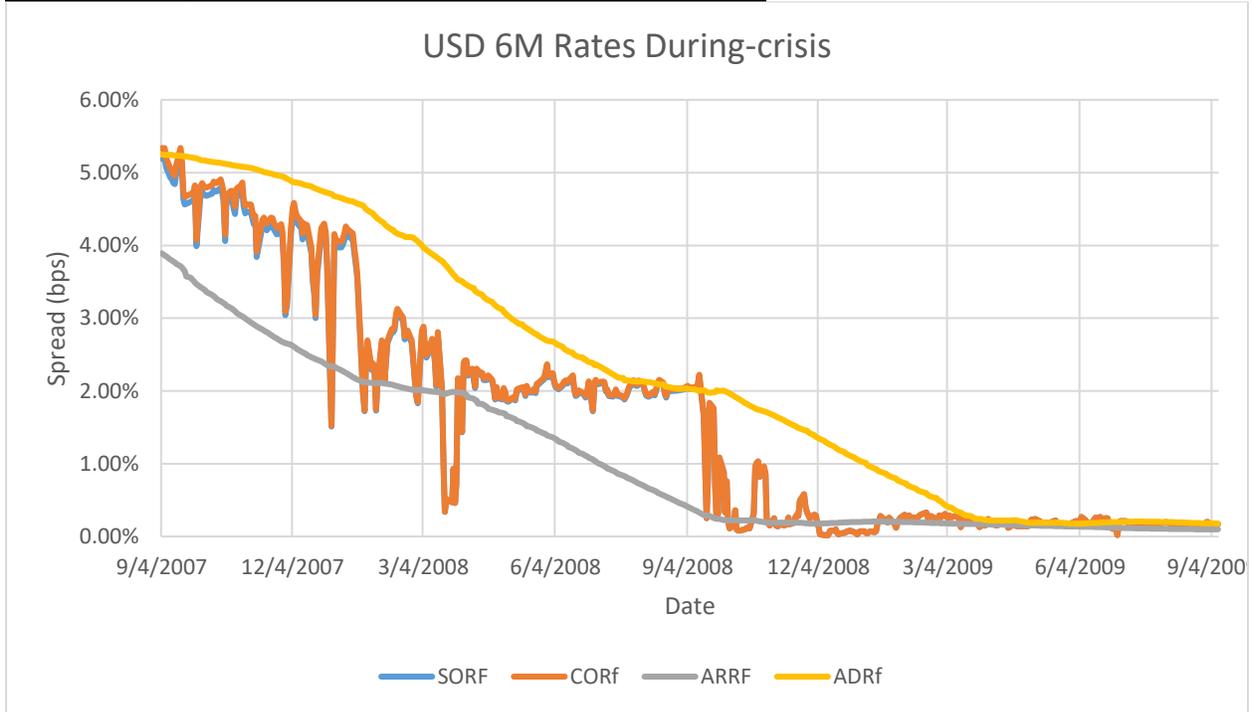
	SORf	CORf	ARRf	ADRf
MIN	2.16%	2.18%	3.85%	3.03%
MAX	5.31%	5.46%	5.29%	5.43%
AVERAGE	4.79%	4.91%	4.90%	4.72%
ST DEV	0.5639%	0.5898%	0.4034%	0.7660%



Source: Bloomberg Finance L.P.

**Graph 8-B**

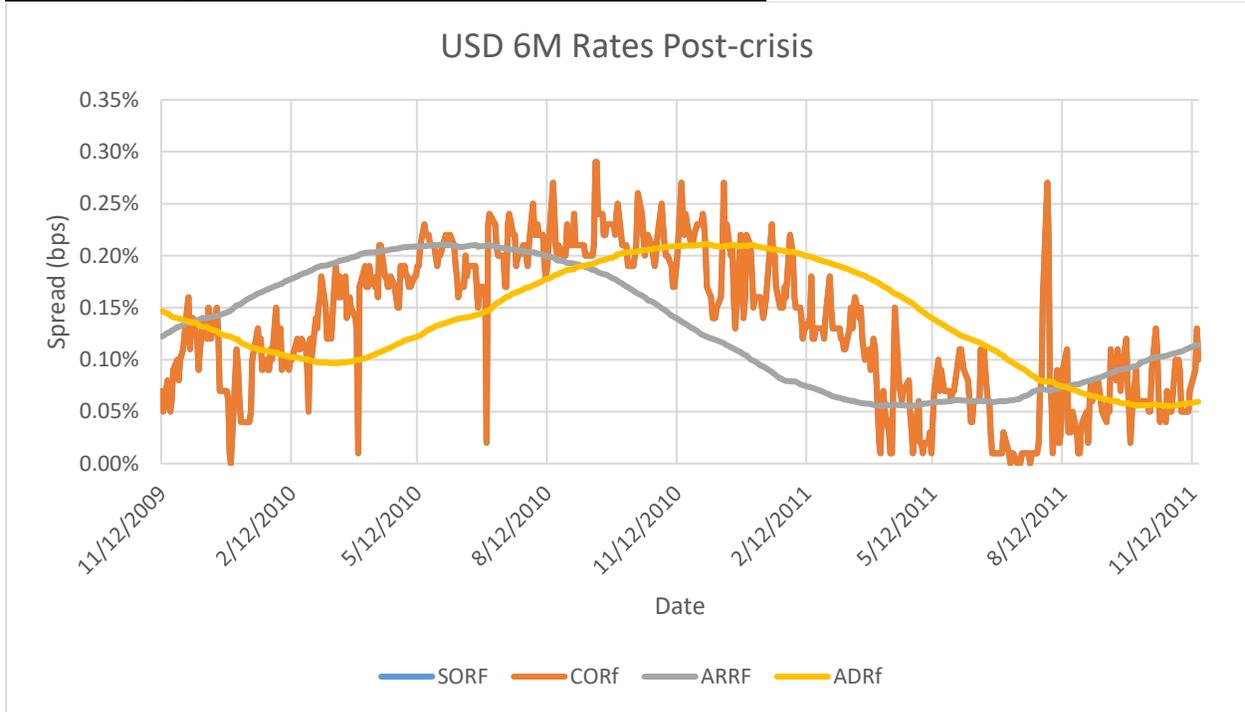
	SORf	CORf	ARRf	ADRf
MIN	0.01%	0.01%	0.10%	0.18%
MAX	5.20%	5.34%	3.89%	5.25%
AVERAGE	1.60%	1.62%	1.09%	2.25%
ST DEV	1.5811%	1.6165%	1.1156%	1.7720%



**Source: Bloomberg Finance L.P.**

**Graph 8-C**

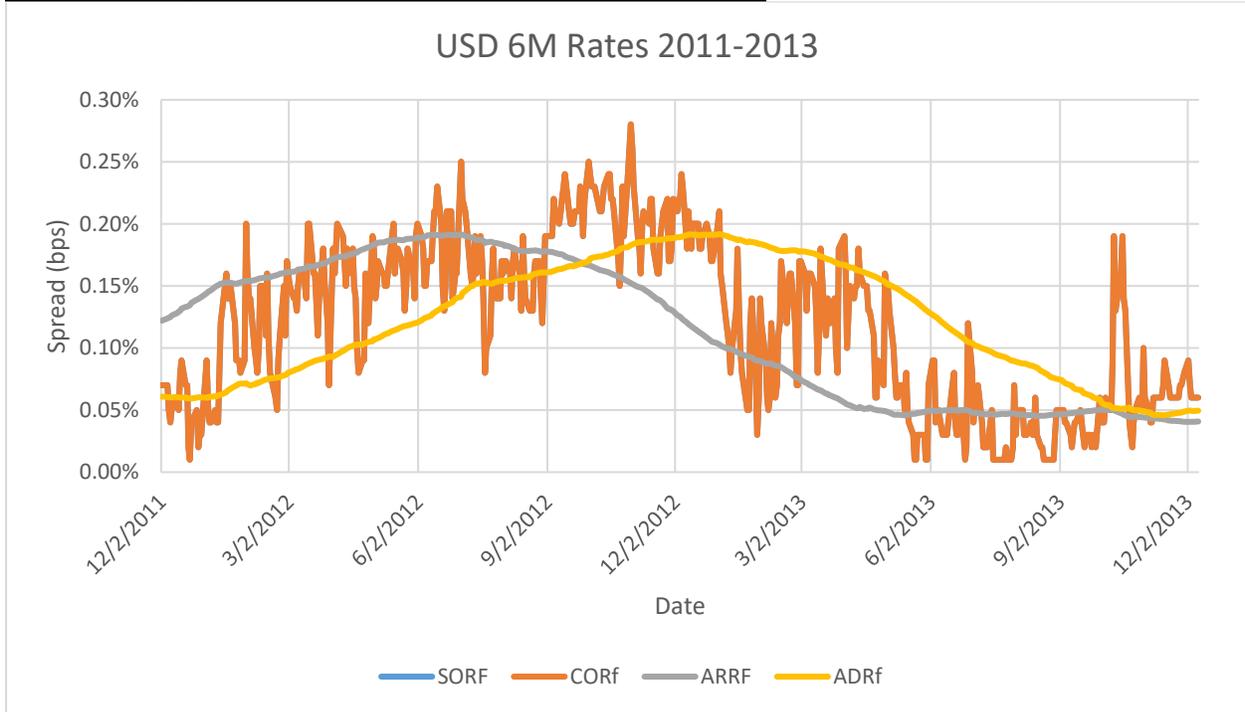
	SORf	CORf	ARRf	ADRf
MIN	0.00%	0.00%	0.06%	0.06%
MAX	0.29%	0.29%	0.21%	0.21%
AVERAGE	0.13%	0.13%	0.13%	0.14%
ST DEV	0.0708%	0.0709%	0.0565%	0.0497%



**Source: Bloomberg Finance L.P.**

**Graph 8-D**

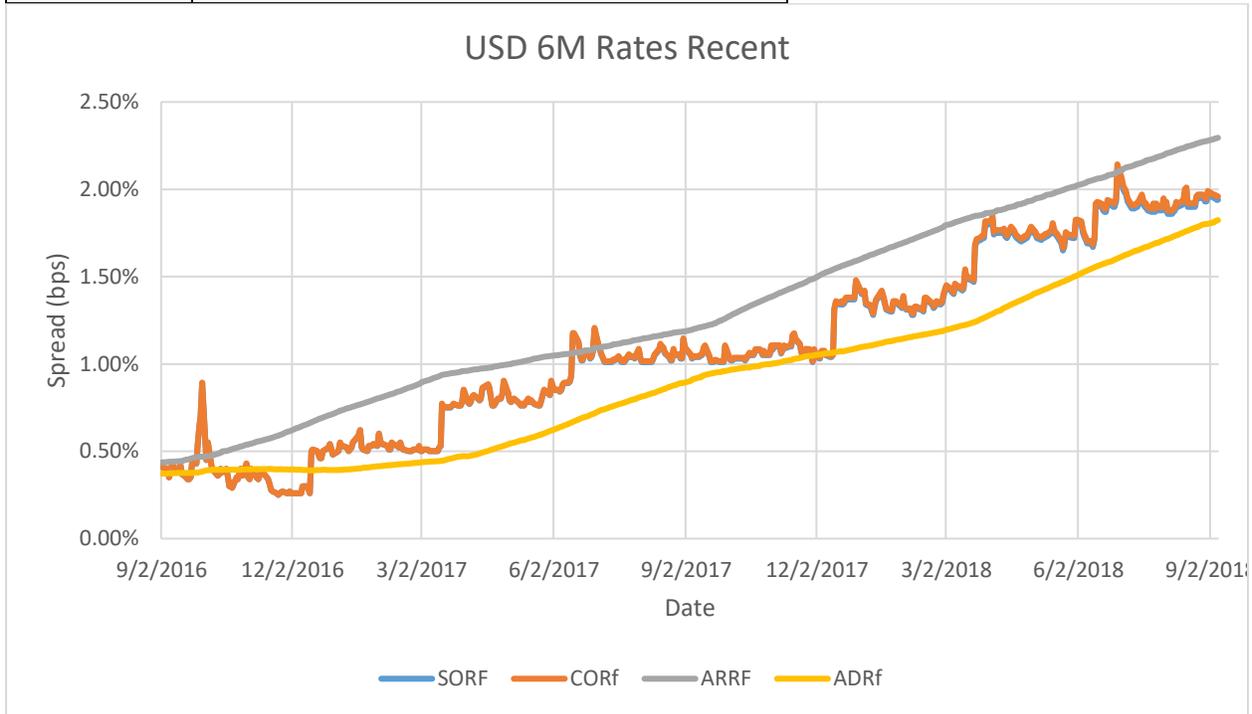
	SORf	CORf	ARRf	ADRf
MIN	0.01%	0.01%	0.04%	0.05%
MAX	0.28%	0.28%	0.19%	0.19%
AVERAGE	0.12%	0.12%	0.11%	0.12%
ST DEV	0.0664%	0.0665%	0.0571%	0.0481%



**Source: Bloomberg Finance L.P.**

**Graph 8-E**

	SORf	CORf	ARRf	ADRf
MIN	0.25%	0.25%	0.44%	0.37%
MAX	2.12%	2.14%	2.30%	1.82%
AVERAGE	1.09%	1.09%	1.32%	0.91%
ST DEV	0.5151%	0.5211%	0.5431%	0.4459%

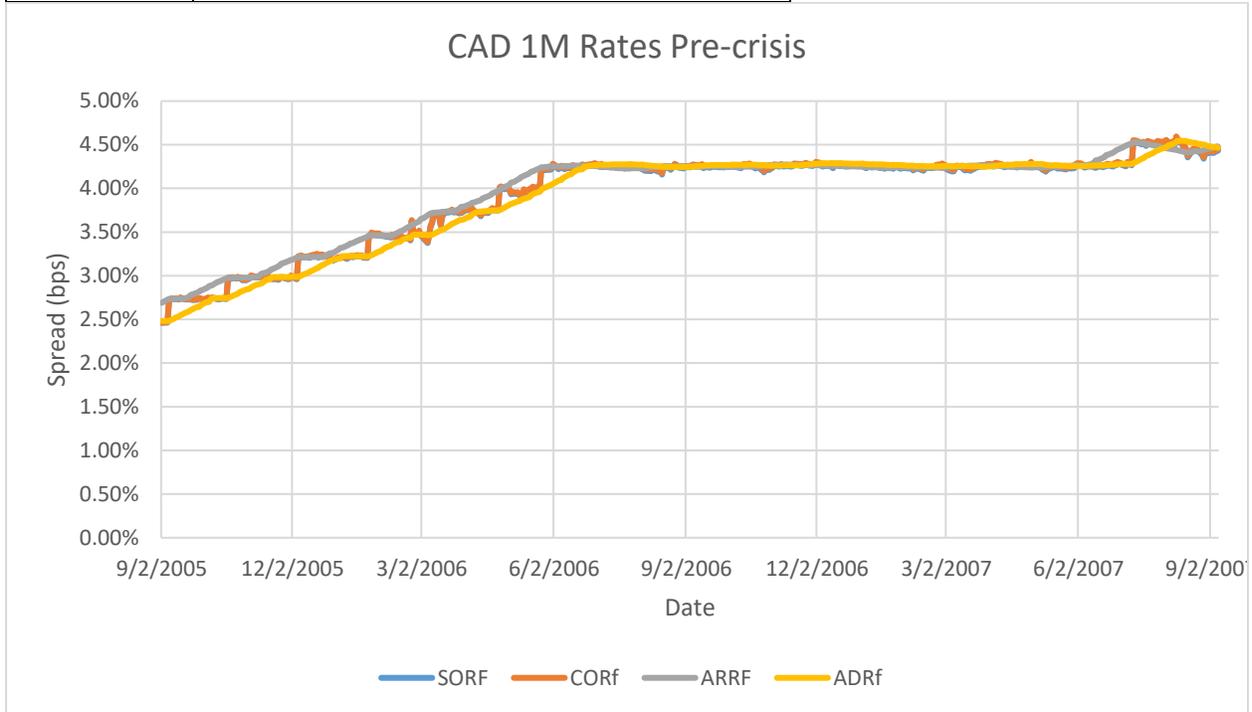


**Source: Bloomberg Finance L.P.**

**1-month CAD (CORRA)**

**Graph 9-A**

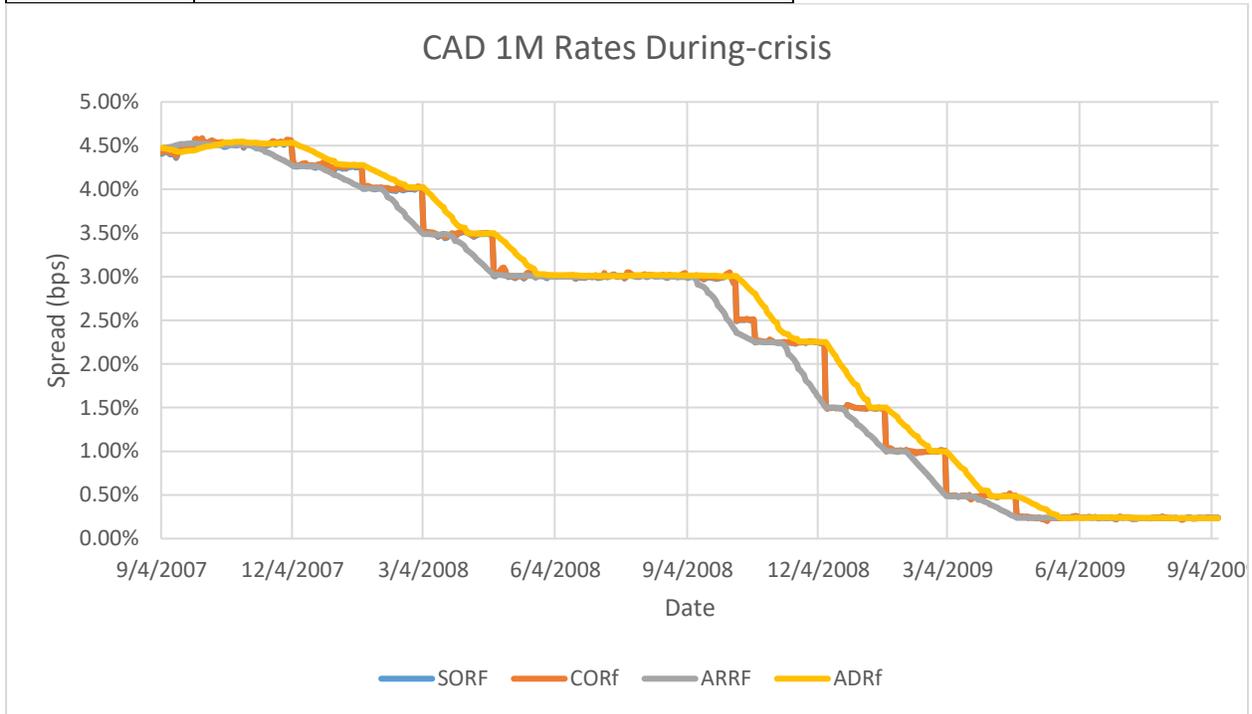
	SORf	CORf	ARRf	ADRf
MIN	2.46%	2.47%	2.69%	2.48%
MAX	4.58%	4.60%	4.53%	4.55%
AVERAGE	3.93%	3.94%	3.97%	3.90%
ST DEV	0.5296%	0.5329%	0.5023%	0.5690%



**Source: Bloomberg Finance L.P.**

**Graph 9-B**

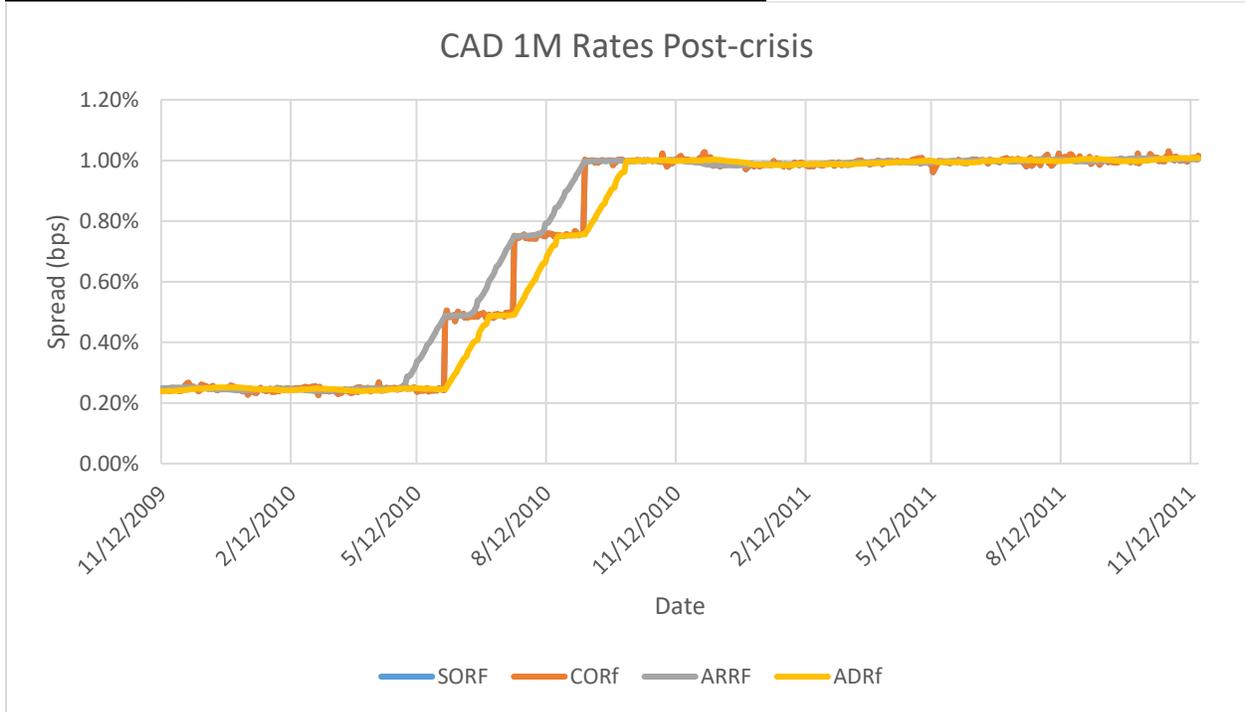
	SORf	CORf	ARRf	ADRf
MIN	0.20%	0.20%	0.23%	0.23%
MAX	4.57%	4.59%	4.53%	4.54%
AVERAGE	2.40%	2.41%	2.32%	2.51%
ST DEV	1.5454%	1.5513%	1.5438%	1.5419%



**Source: Bloomberg Finance L.P.**

**Graph 9-C**

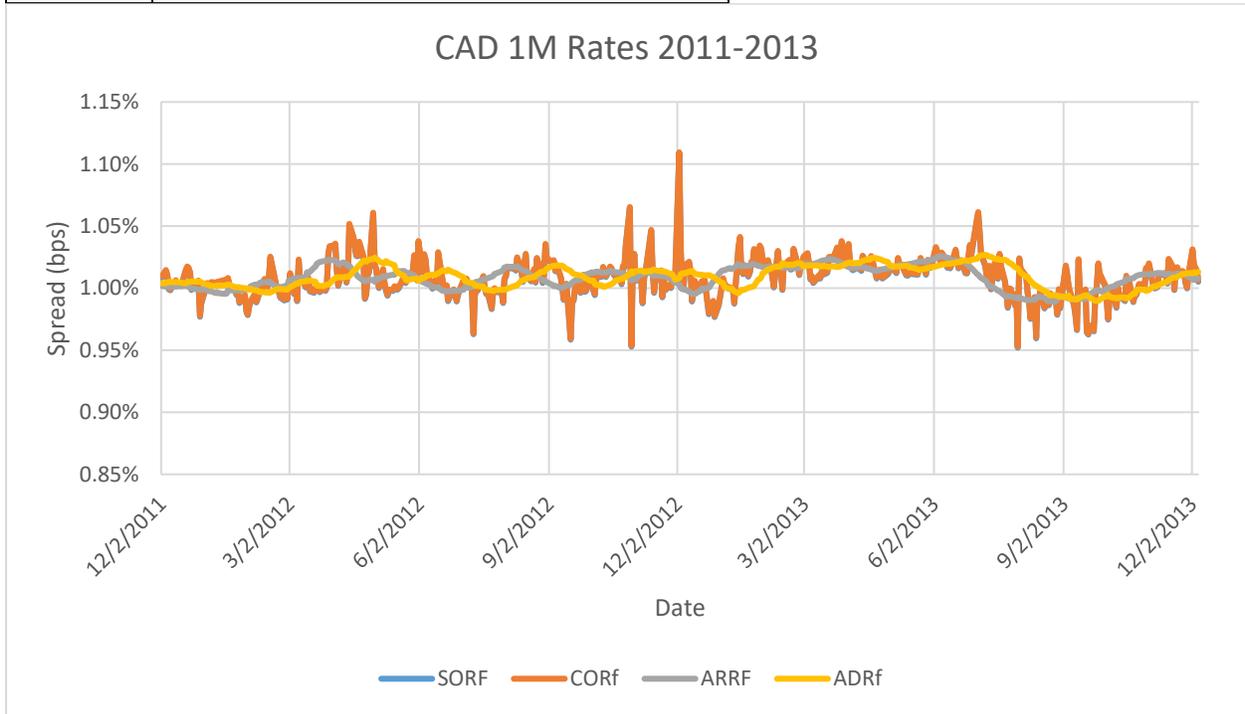
	SORf	CORf	ARRf	ADRf
MIN	0.23%	0.23%	0.24%	0.24%
MAX	1.03%	1.03%	1.01%	1.01%
AVERAGE	0.74%	0.74%	0.76%	0.72%
ST DEV	0.3318%	0.3321%	0.3240%	0.3360%



**Source: Bloomberg Finance L.P.**

**Graph 9-D**

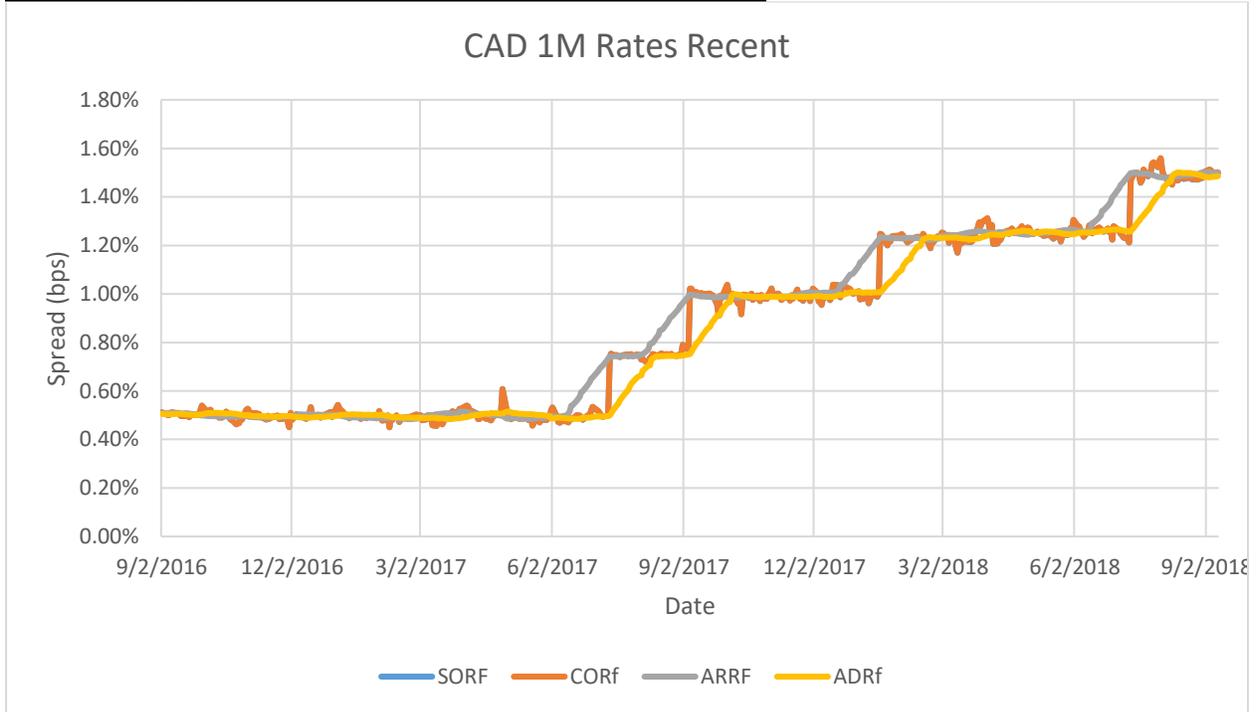
	SORf	CORf	ARRf	ADRf
MIN	0.95%	0.95%	0.99%	0.99%
MAX	1.11%	1.11%	1.03%	1.03%
AVERAGE	1.01%	1.01%	1.01%	1.01%
ST DEV	0.0156%	0.0156%	0.0091%	0.0091%



**Source: Bloomberg Finance L.P.**

**Graph 9-E**

	SORf	CORf	ARRf	ADRf
MIN	0.45%	0.45%	0.48%	0.48%
MAX	1.56%	1.56%	1.50%	1.50%
AVERAGE	0.87%	0.87%	0.89%	0.85%
ST DEV	0.3587%	0.3592%	0.3634%	0.3479%

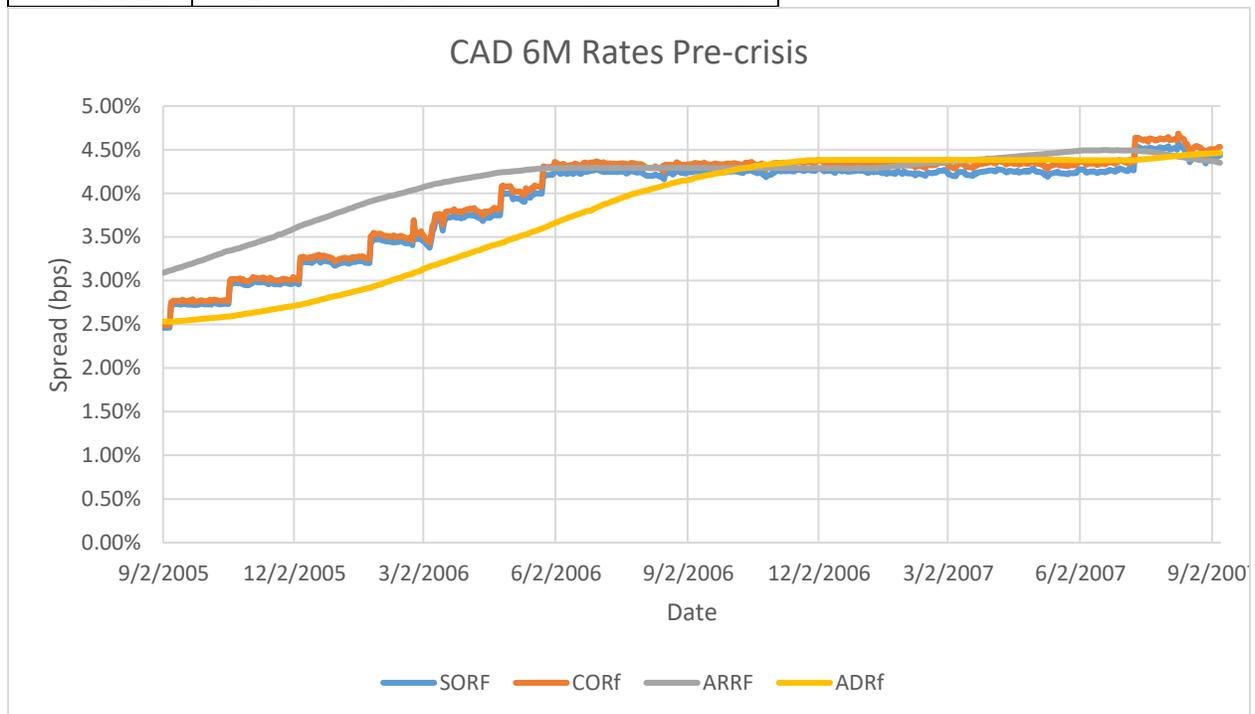


**Source: Bloomberg Finance L.P.**

## 6-month CAD (CORRA)

**Graph 10-A**

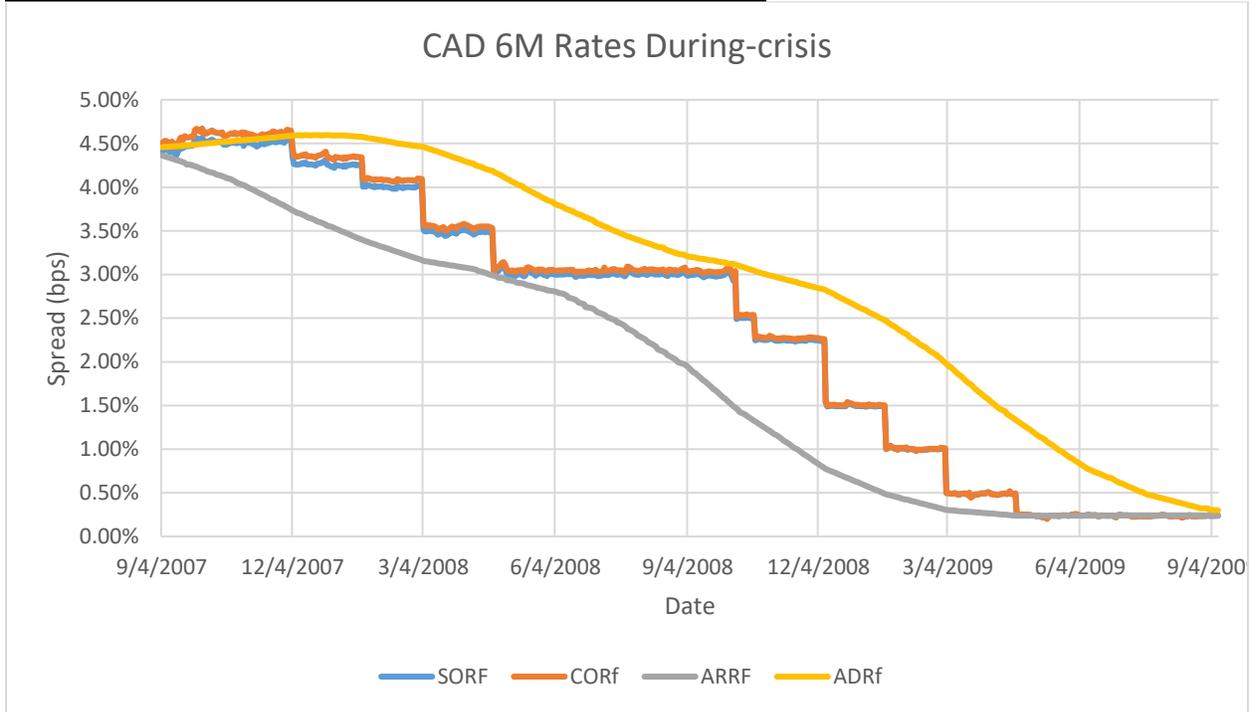
	SORf	CORf	ARRf	ADRf
MIN	2.46%	2.49%	3.09%	2.53%
MAX	4.58%	4.68%	4.49%	4.46%
AVERAGE	3.93%	4.01%	4.15%	3.80%
ST DEV	0.5296%	0.5493%	0.3563%	0.6846%



**Source: Bloomberg Finance L.P.**

**Graph 10-B**

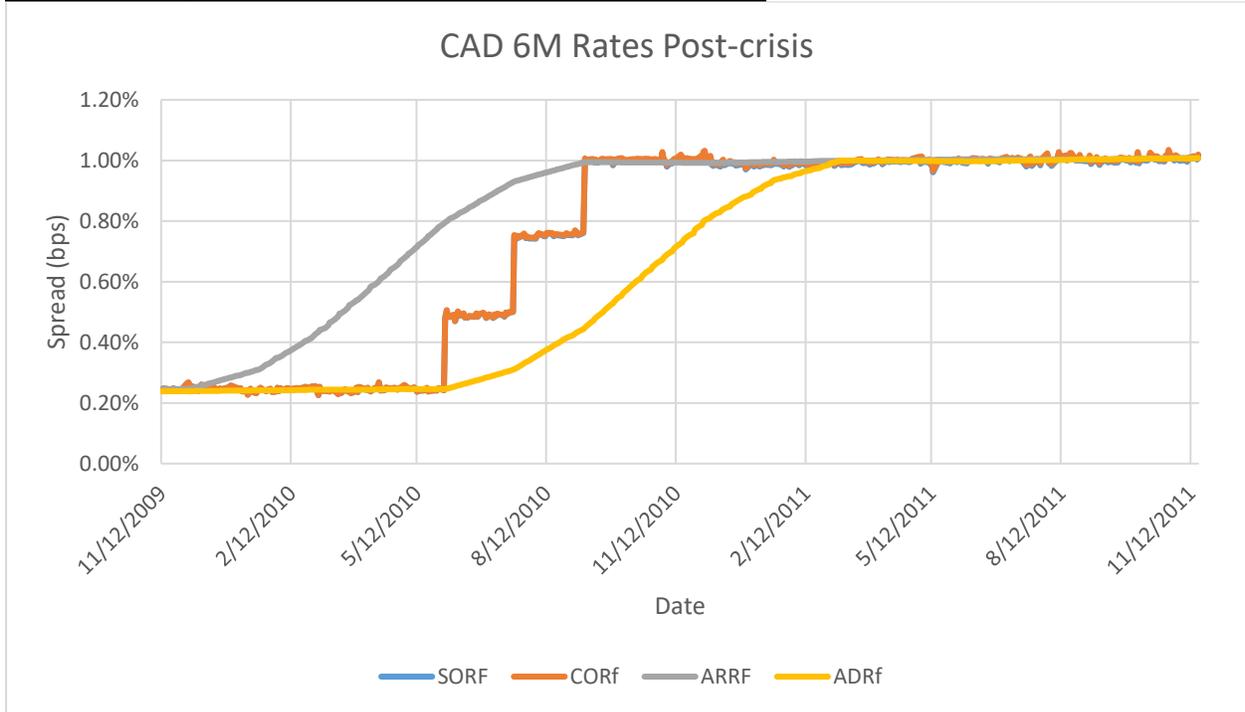
	SORf	CORf	ARRf	ADRf
MIN	0.20%	0.20%	0.24%	0.30%
MAX	4.57%	4.67%	4.36%	4.60%
AVERAGE	2.40%	2.44%	1.91%	3.00%
ST DEV	1.5454%	1.5807%	1.4396%	1.4162%



**Source: Bloomberg Finance L.P.**

**Graph 10-C**

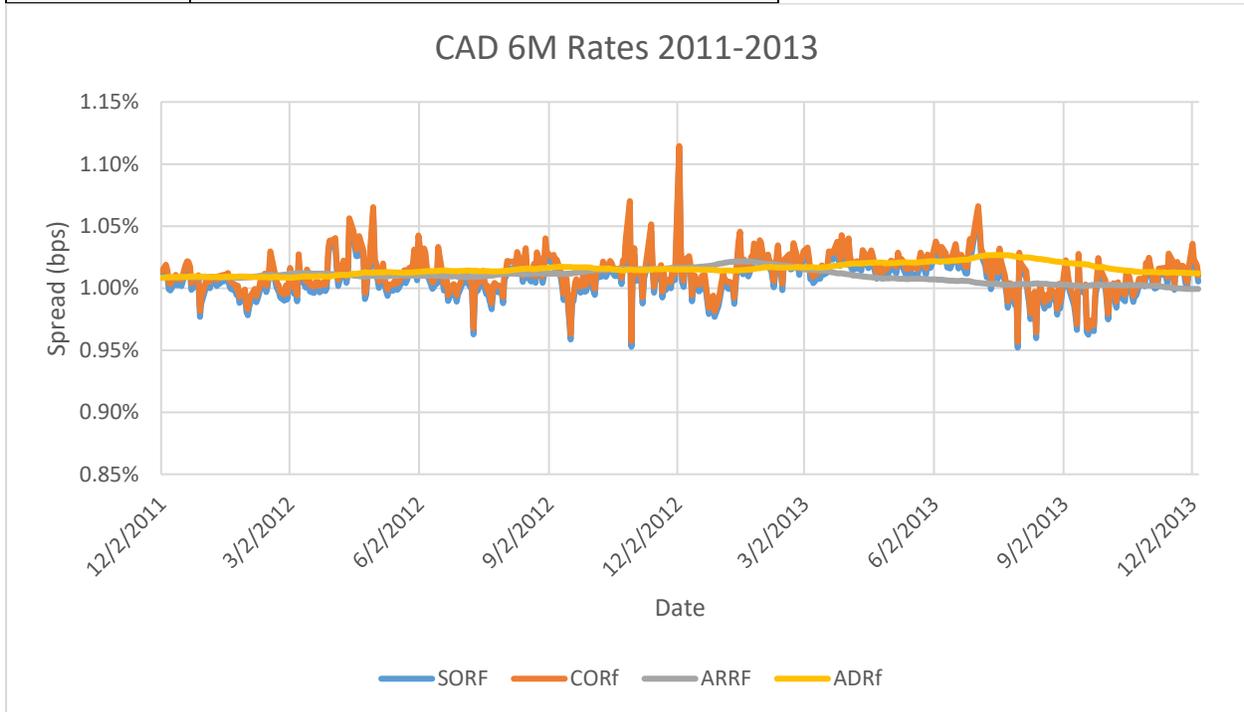
	SORf	CORf	ARRf	ADRf
MIN	0.23%	0.23%	0.25%	0.24%
MAX	1.03%	1.03%	1.01%	1.01%
AVERAGE	0.74%	0.74%	0.84%	0.65%
ST DEV	0.3318%	0.3339%	0.2594%	0.3372%



**Source: Bloomberg Finance L.P.**

**Graph 10-D**

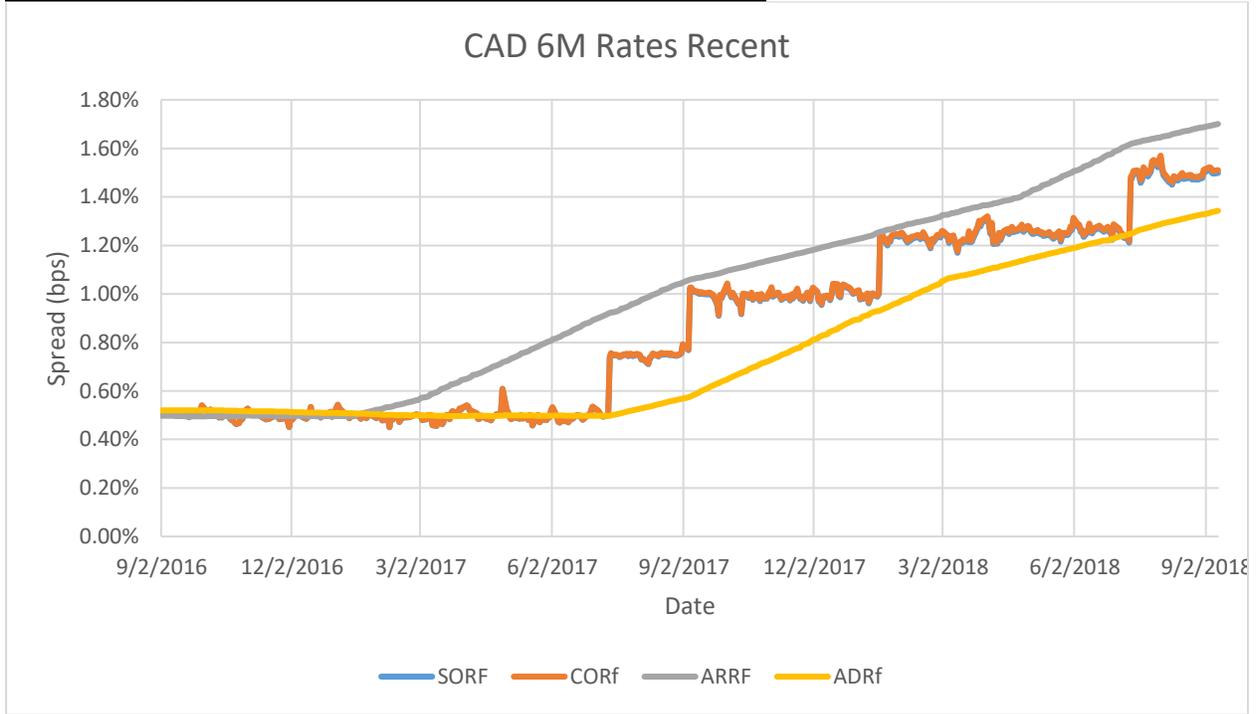
	SORf	CORf	ARRf	ADRf
MIN	0.95%	0.96%	1.00%	1.01%
MAX	1.11%	1.11%	1.02%	1.03%
AVERAGE	1.01%	1.01%	1.01%	1.02%
ST DEV	0.0156%	0.0158%	0.0053%	0.0046%



**Source: Bloomberg Finance L.P.**

**Graph 10-E**

	SORf	CORf	ARRf	ADRf
MIN	0.45%	0.45%	0.50%	0.50%
MAX	1.56%	1.57%	1.70%	1.34%
AVERAGE	0.87%	0.87%	1.01%	0.76%
ST DEV	0.3587%	0.3620%	0.3956%	0.2976%

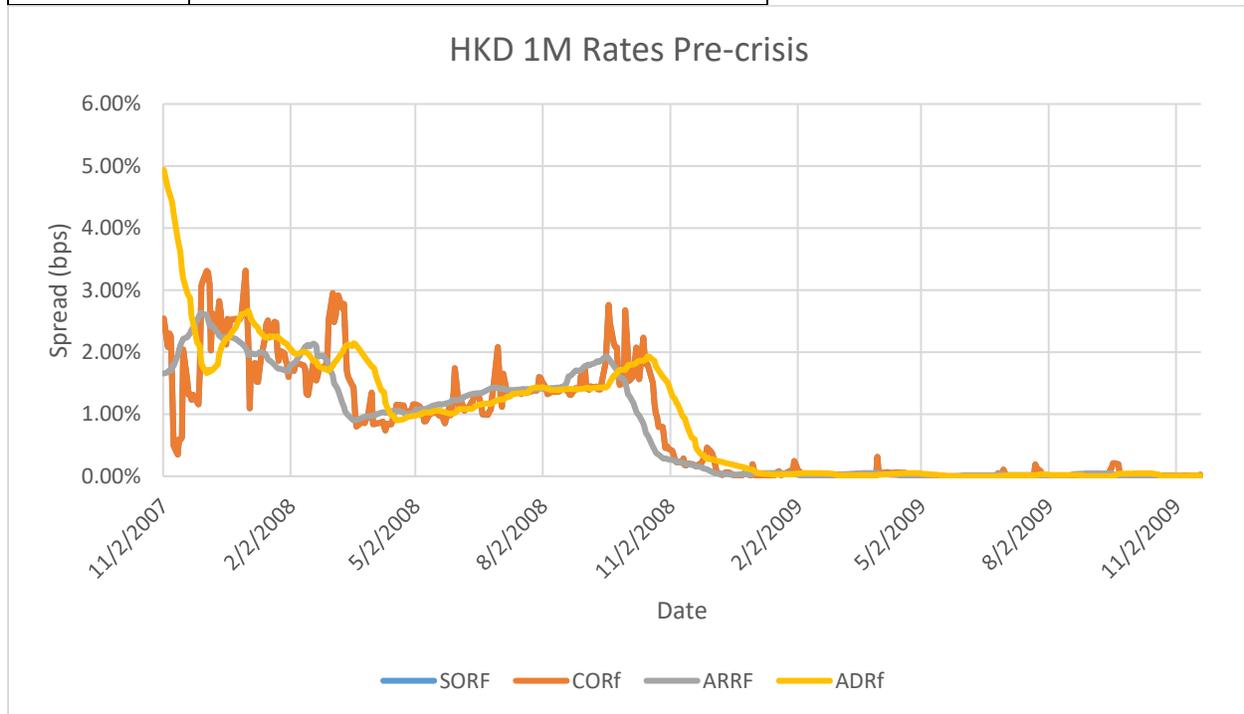


**Source: Bloomberg Finance L.P.**

## 1-month HKD (HONIA)

**Graph 11-A**

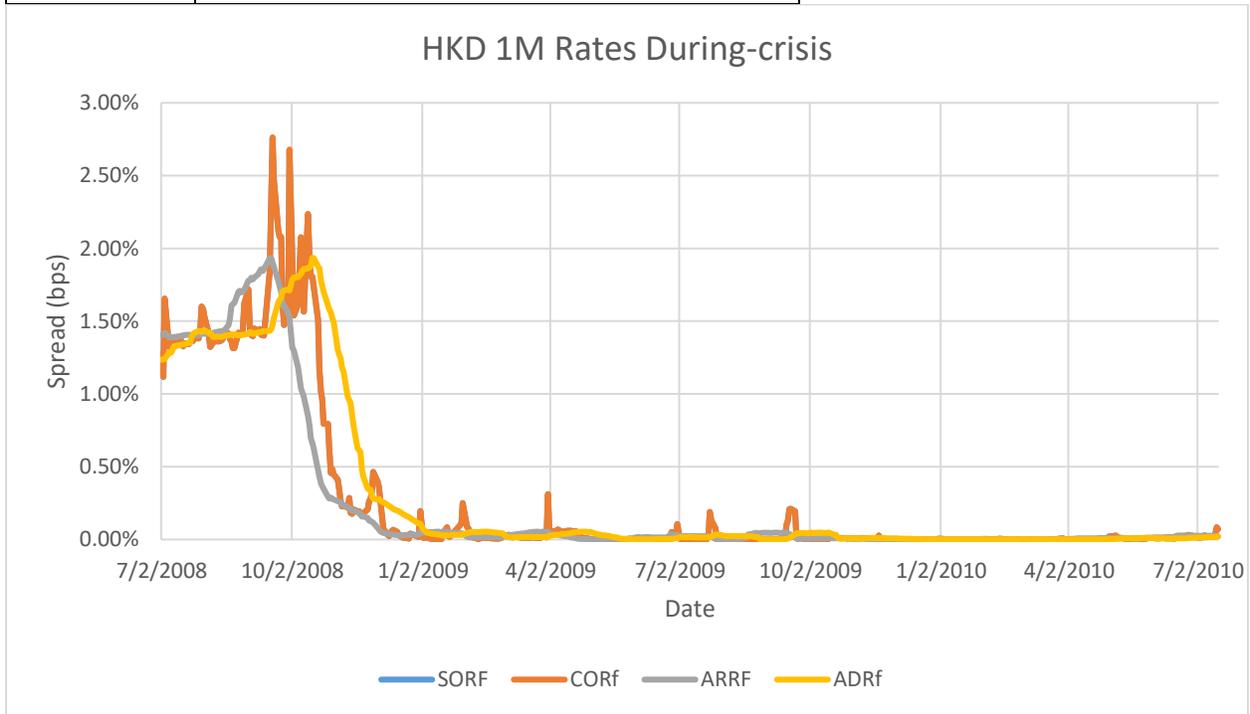
	SORf	CORf	ARRf	ADRf
MIN	0.00%	0.00%	0.00%	0.00%
MAX	3.31%	3.32%	2.63%	4.94%
AVERAGE	0.78%	0.78%	0.75%	0.89%
ST DEV	0.8728%	0.8745%	0.8232%	0.9683%



**Source: Bloomberg Finance L.P.**

**Graph 11-B**

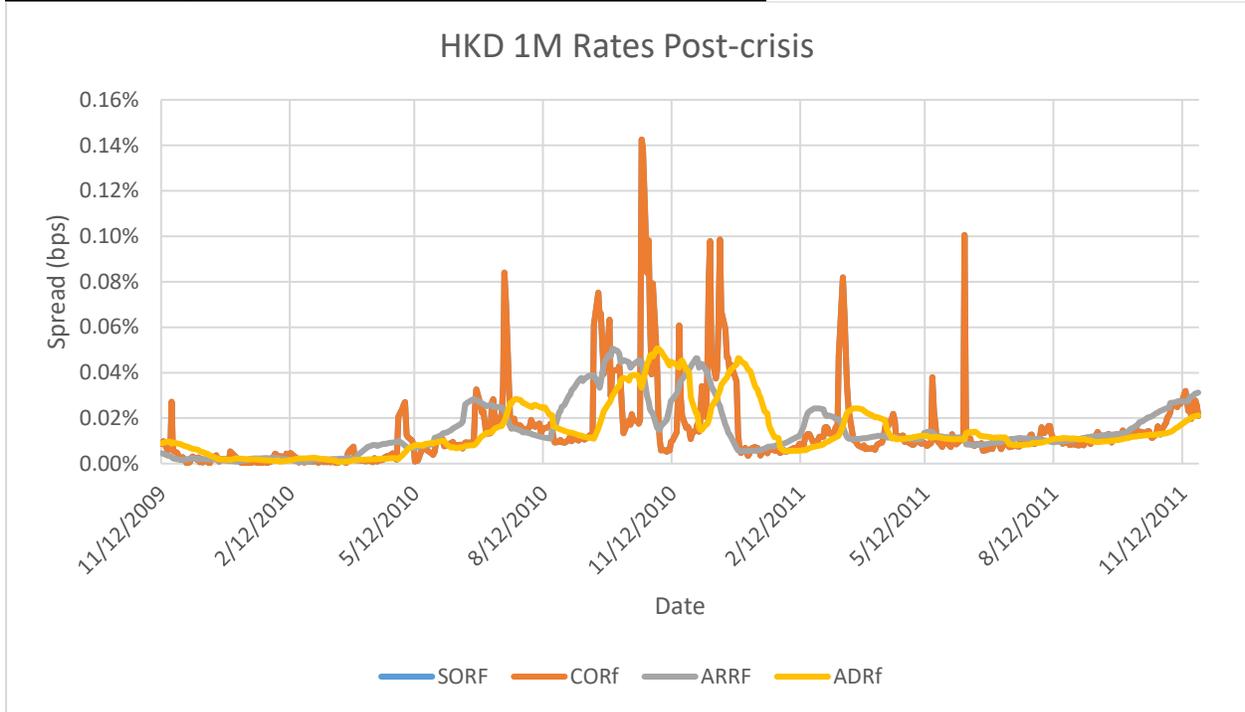
	SORf	CORf	ARRf	ADRf
MIN	0.00%	0.00%	0.00%	0.00%
MAX	2.76%	2.76%	1.93%	1.94%
AVERAGE	0.27%	0.27%	0.24%	0.30%
ST DEV	0.5688%	0.5697%	0.5268%	0.5693%



**Source: Bloomberg Finance L.P.**

**Graph 11-C**

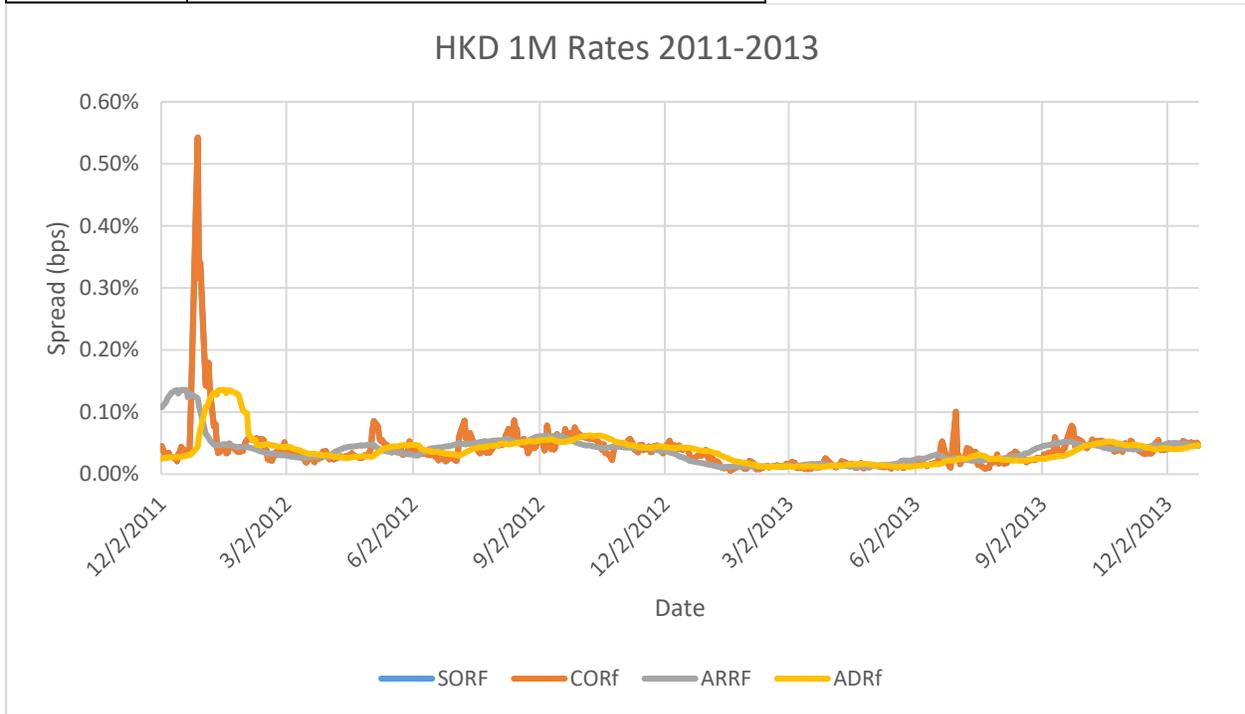
	SORf	CORf	ARRf	ADRf
MIN	0.00%	0.00%	0.00%	0.00%
MAX	0.14%	0.14%	0.05%	0.05%
AVERAGE	0.01%	0.01%	0.02%	0.01%
ST DEV	0.0180%	0.0180%	0.0118%	0.0118%



**Source: Bloomberg Finance L.P.**

**Graph 11-D**

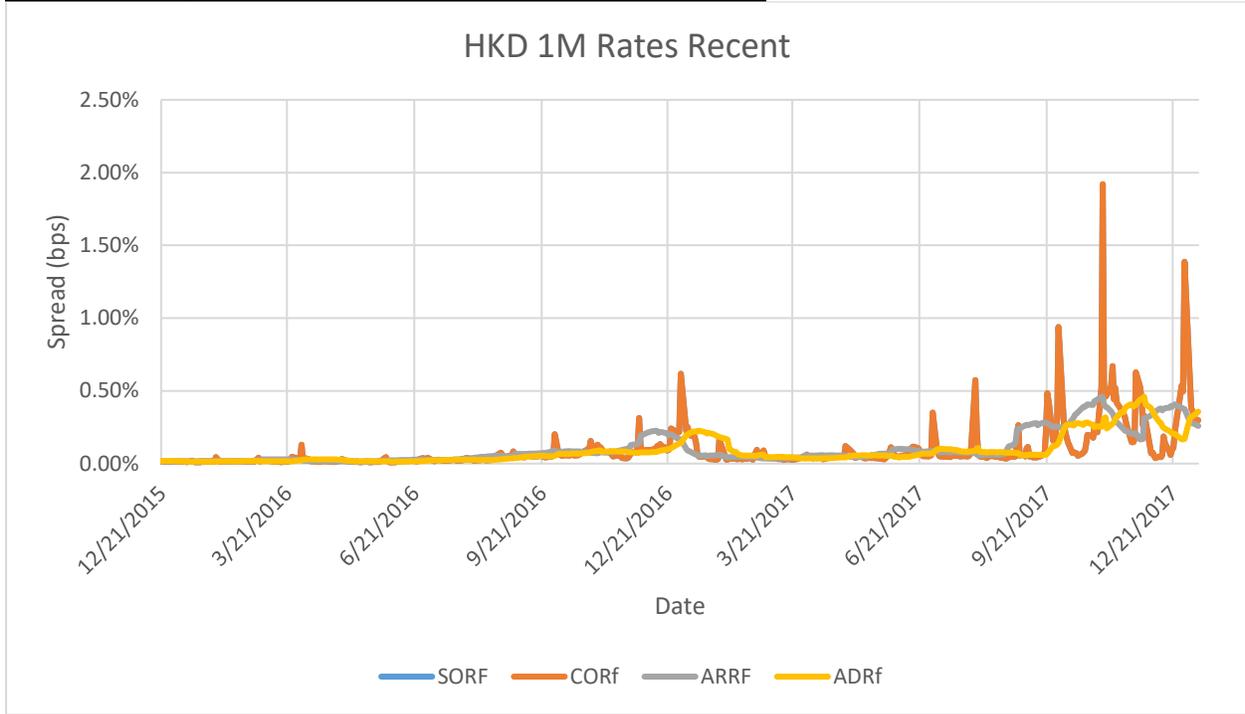
	SORf	CORf	ARRf	ADRf
MIN	0.01%	0.01%	0.01%	0.01%
MAX	0.54%	0.54%	0.14%	0.14%
AVERAGE	0.04%	0.04%	0.04%	0.04%
ST DEV	0.0353%	0.0353%	0.0223%	0.0221%



**Source: Bloomberg Finance L.P.**

**Graph 11-E**

	SORf	CORf	ARRf	ADRf
MIN	0.01%	0.01%	0.01%	0.01%
MAX	1.92%	1.92%	0.46%	0.46%
AVERAGE	0.09%	0.09%	0.10%	0.09%
ST DEV	0.1537%	0.1539%	0.1090%	0.0964%

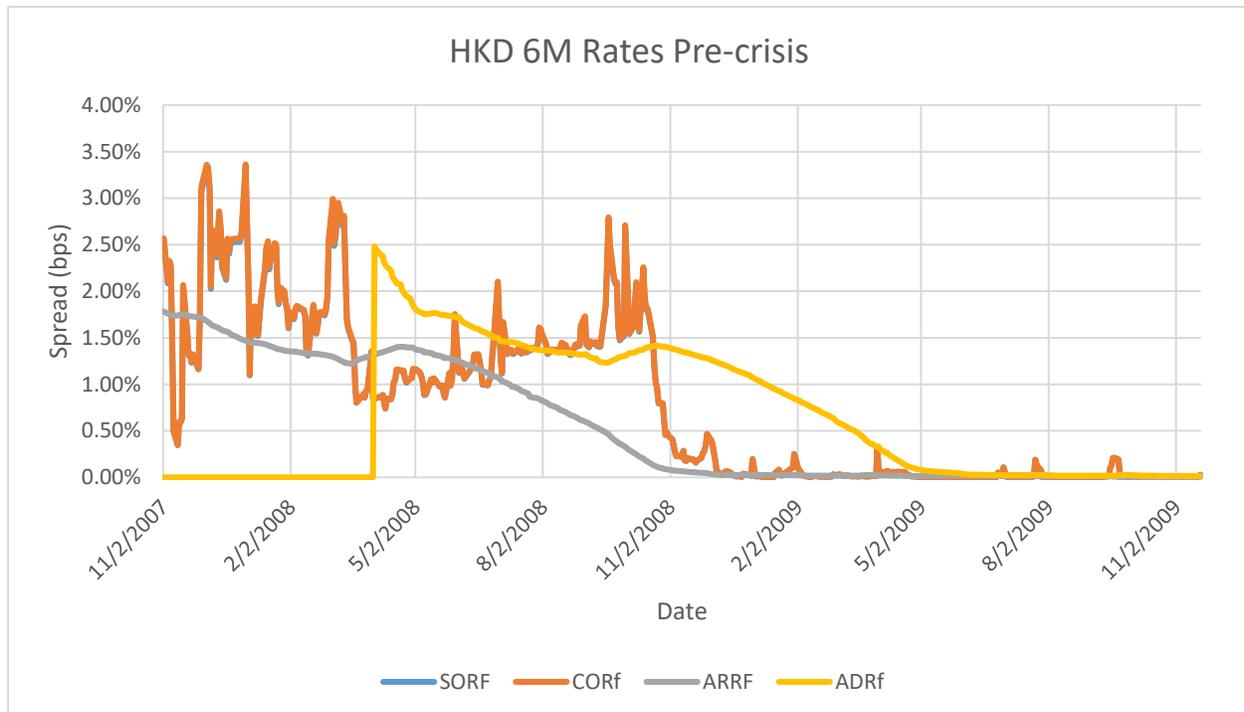


**Source: Bloomberg Finance L.P.**

## 6-month HKD

Graph 12-A

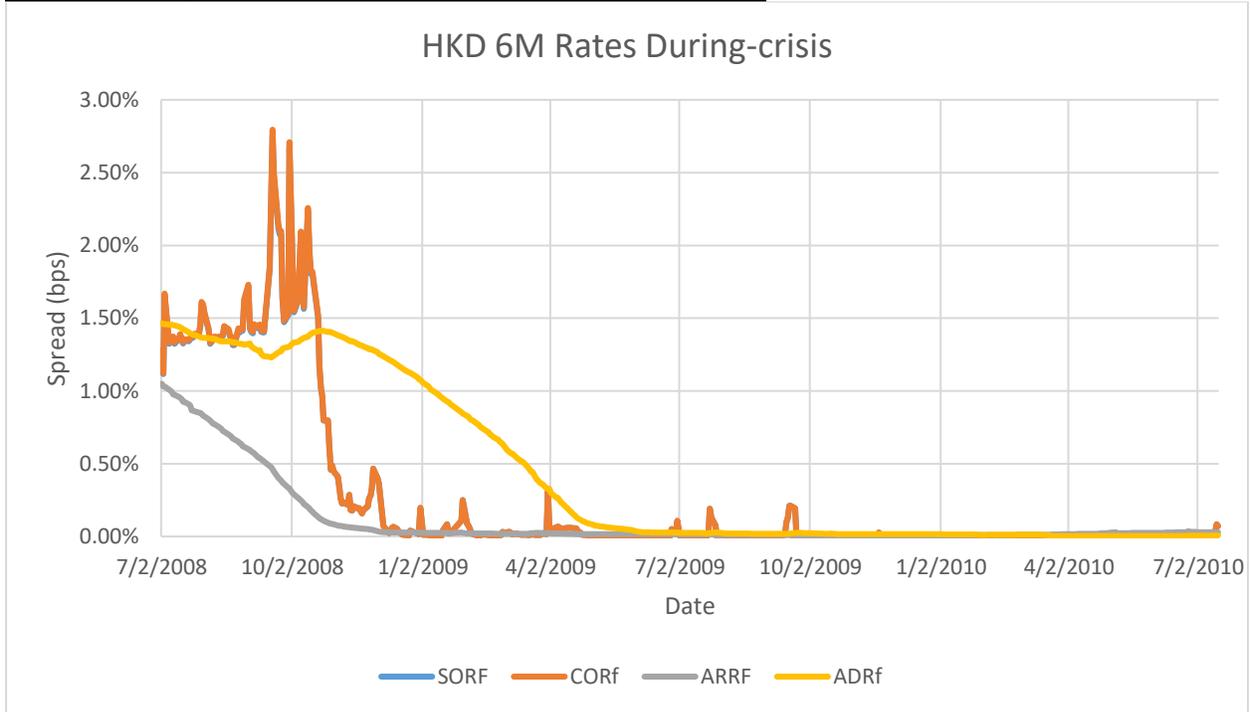
	SORf	CORf	ARRf	ADRf
MIN	0.00%	0.00%	0.00%	0.02%
MAX	3.31%	3.36%	1.78%	2.48%
AVERAGE	0.78%	0.79%	0.55%	0.80%
ST DEV	0.8728%	0.8827%	0.6326%	0.6999%



Source: Bloomberg Finance L.P.

**Graph 12-B**

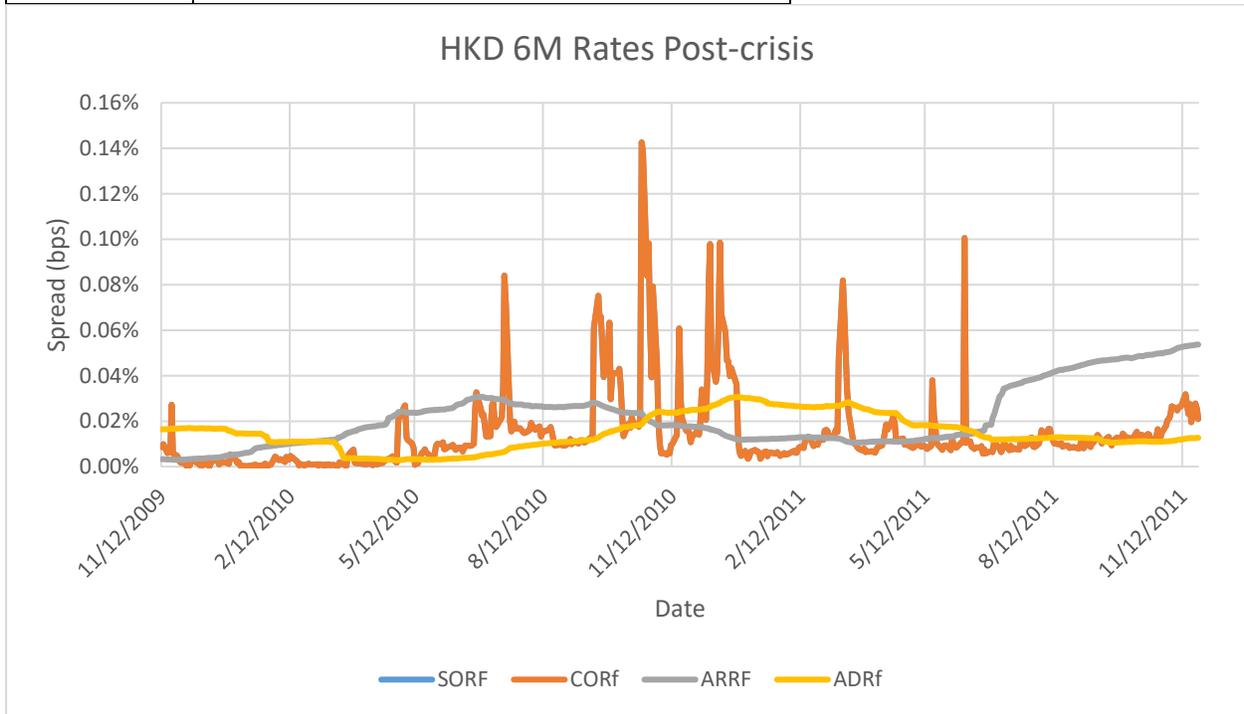
	SORf	CORf	ARRf	ADRf
MIN	0.00%	0.00%	0.00%	0.00%
MAX	2.76%	2.79%	1.05%	1.46%
AVERAGE	0.27%	0.27%	0.11%	0.43%
ST DEV	0.5688%	0.5738%	0.2408%	0.5639%



**Source: Bloomberg Finance L.P.**

**Graph 12-C**

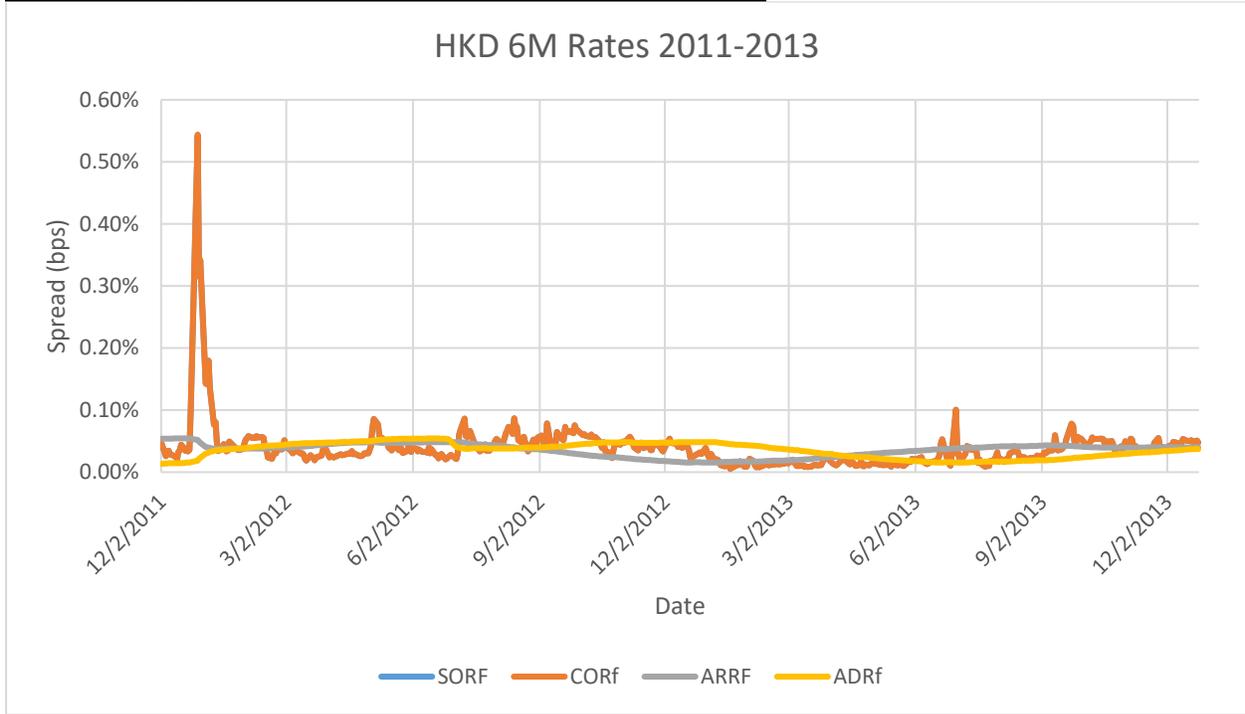
	SORf	CORf	ARRf	ADRf
MIN	0.00%	0.00%	0.00%	0.00%
MAX	0.14%	0.14%	0.05%	0.03%
AVERAGE	0.01%	0.01%	0.02%	0.02%
ST DEV	0.0180%	0.0180%	0.0135%	0.0077%



**Source: Bloomberg Finance L.P.**

**Graph 12-D**

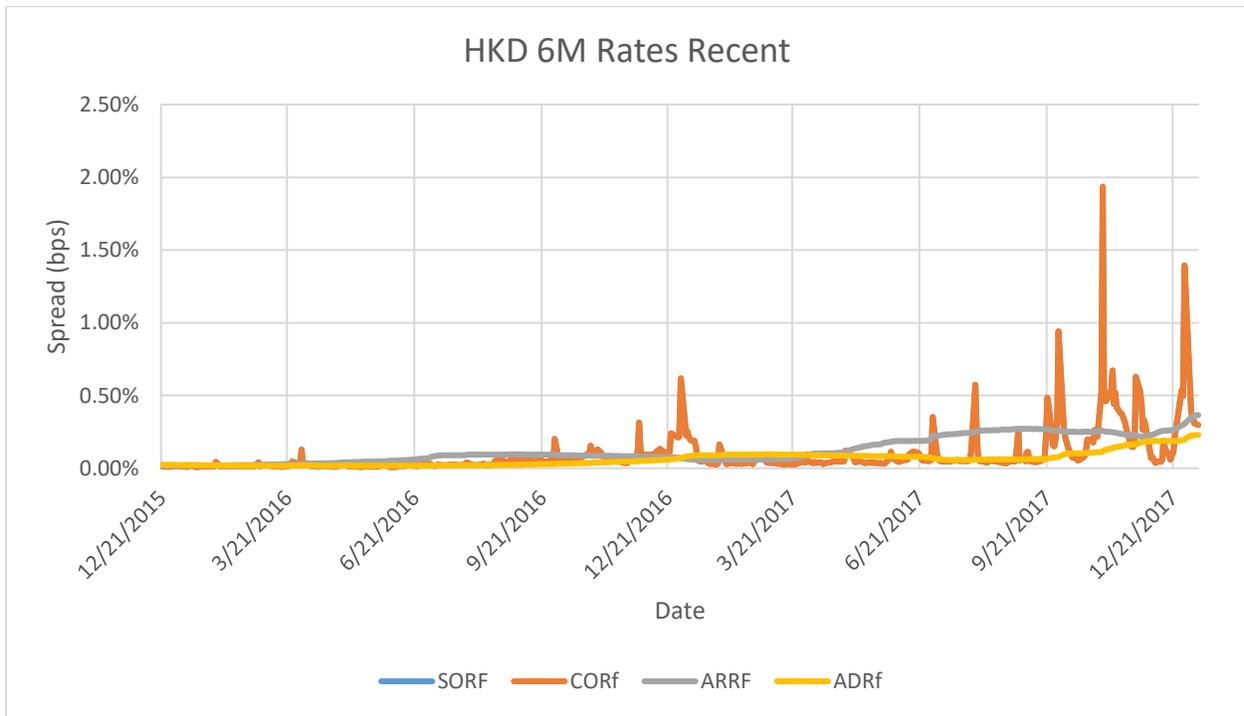
	SORf	CORf	ARRf	ADRf
MIN	0.01%	0.01%	0.02%	0.01%
MAX	0.54%	0.54%	0.05%	0.05%
AVERAGE	0.04%	0.04%	0.04%	0.04%
ST DEV	0.0353%	0.0353%	0.0106%	0.0123%



**Source: Bloomberg Finance L.P.**

**Graph 12-E**

	SORf	CORf	ARRf	ADRf
MIN	0.01%	0.01%	0.02%	0.02%
MAX	1.92%	1.94%	0.37%	0.23%
AVERAGE	0.09%	0.09%	0.12%	0.06%
ST DEV	0.1537%	0.1546%	0.0884%	0.0470%



**Source: Bloomberg Finance L.P.**

## **Spread Adjustments**

### **Forward Approach**

As this is a "forward looking" method, the input *market* data is based upon the market swap quotes from only one day. Maturities and curve construction varied across the three currencies.

The graphs are based upon forward swap (or FRA) rates, obtained (calibrated) via "dual curve stripping" of the input swap curves, using standard Bloomberg interpolation/extrapolation methods (extrapolation beyond the final input maturity is based upon "constant forward" extrapolation).

For more information on swap curve construction, dual curve stripping, and interpolation/extrapolation methods, please see OIS <go> on a Bloomberg Terminal.

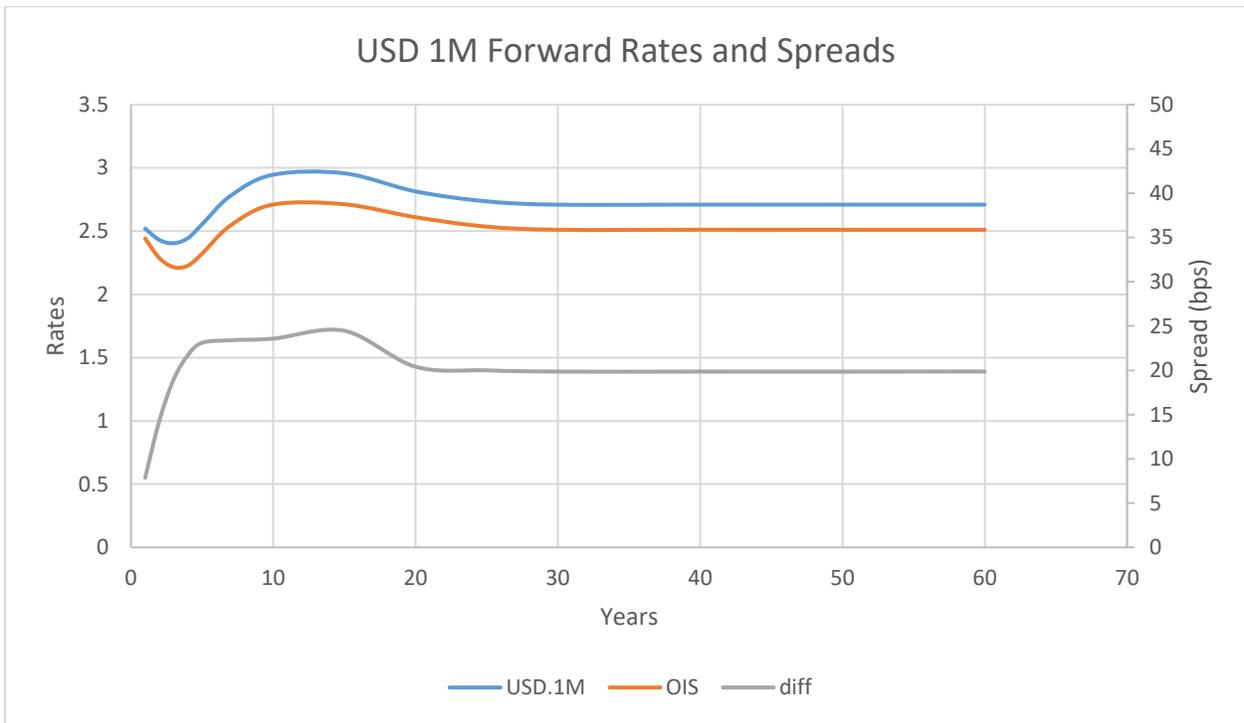
**Graphs 13 through 24 illustrate the forwards computed from the IBOR swap and RFR swap curves and their spreads, in several IBOR tenors.**

**NOTE1:** The forward credit spreads shown have multiple points of inflection (*i.e.*, they vary back and forth between convex and concave shape, etc.). This could be improved with **joint** curve calibration/stripping. However for the purpose of this consultation, these graphs should suffice as a reasonable, approximate representation of forwards spreads.

**NOTE2:** The RFR swap forwards that are projected from this calibration of OIS market quotes, are (implicitly) consistent with the compounded setting in arrears rate, as described in Annex A of the ISDA July 2018 Consultation.

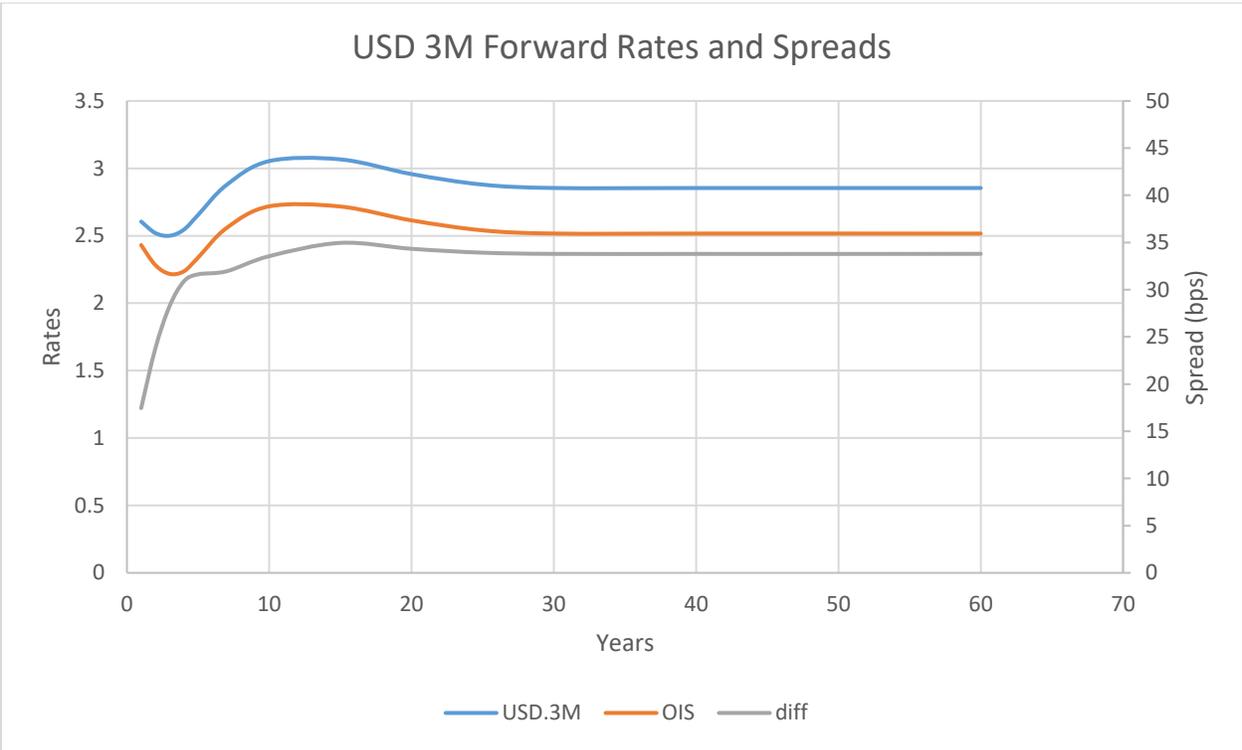
**USD (SOFR)**

**Graph 13**



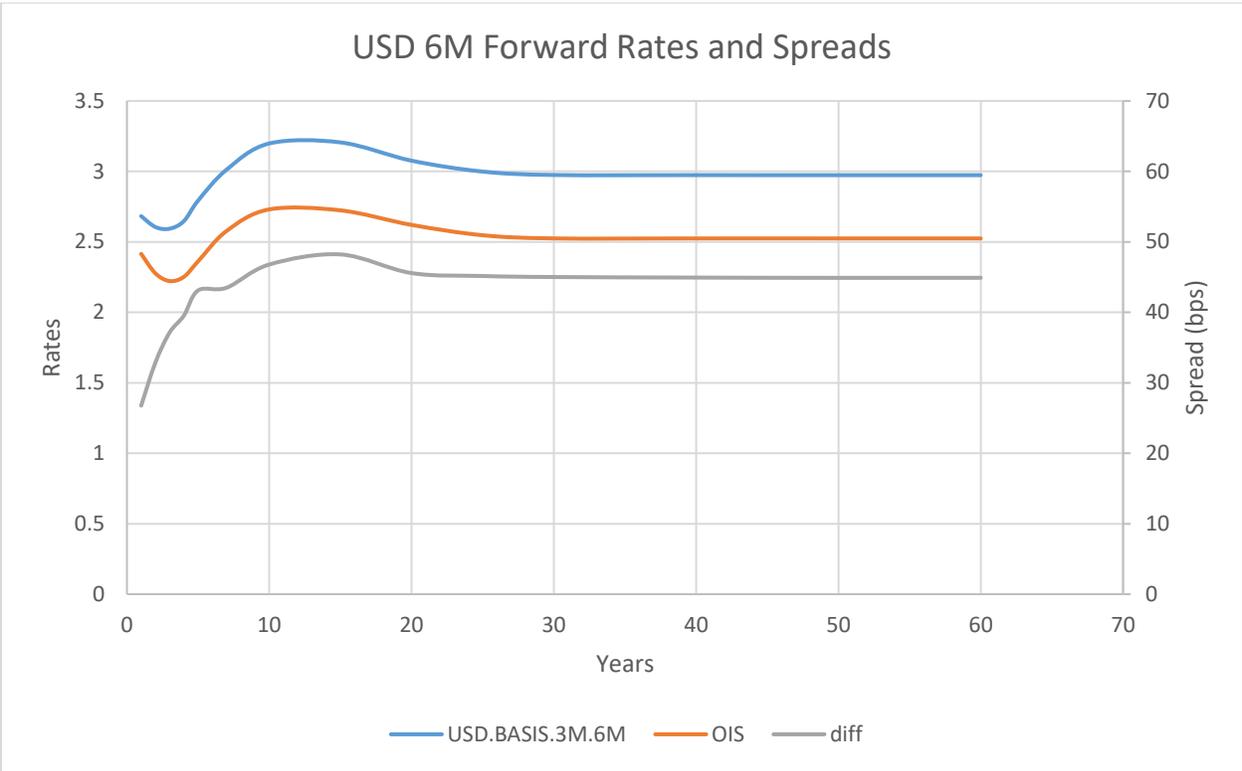
**Source: Bloomberg Finance L.P.**

**Graph 14**



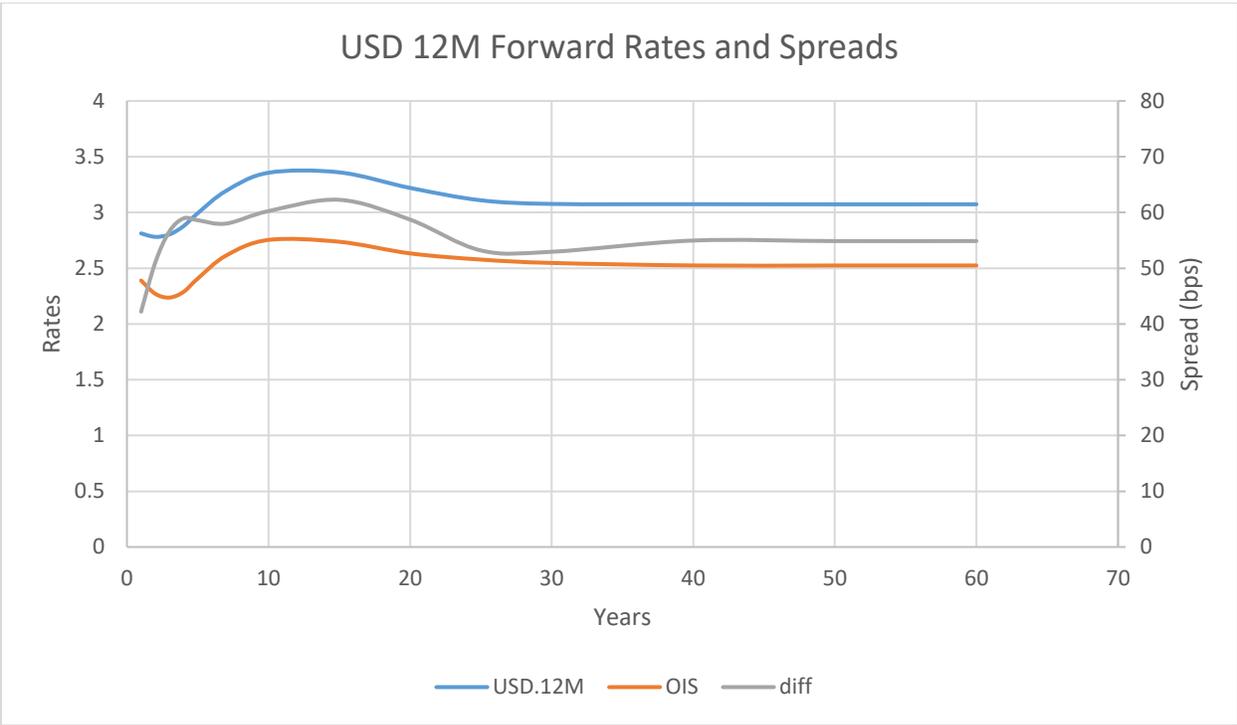
**Source: Bloomberg Finance L.P.**

**Graph 15**



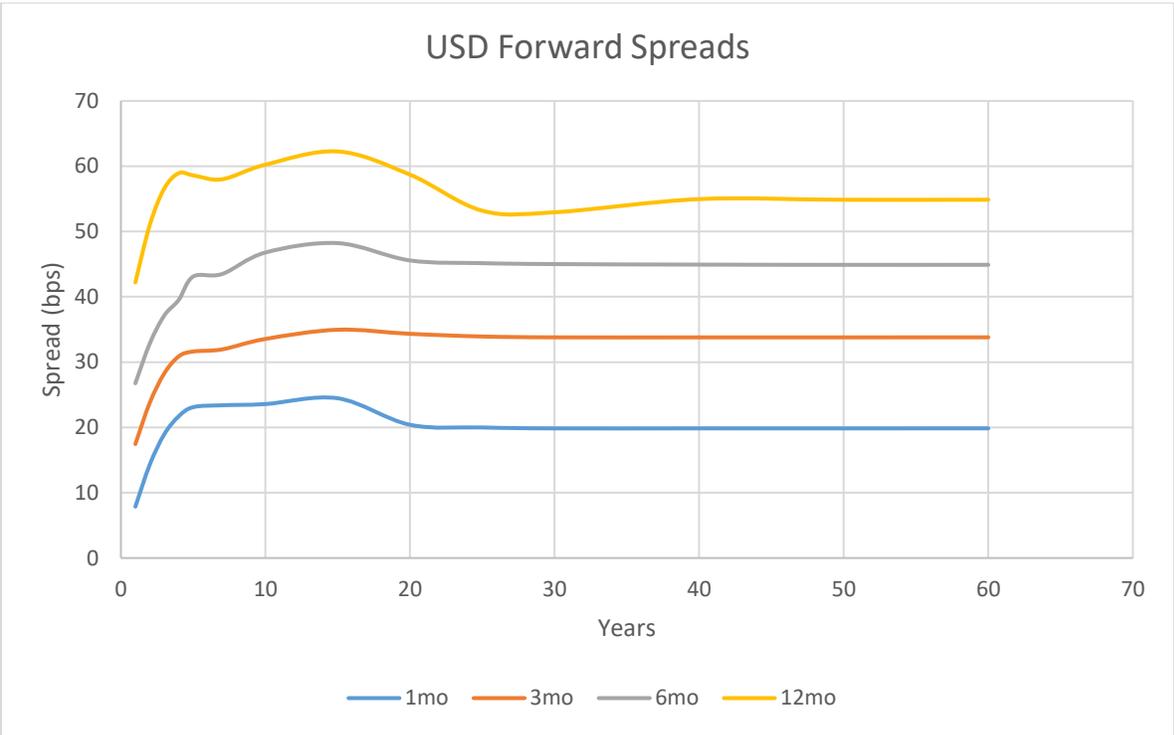
**Source: Bloomberg Finance L.P.**

**Graph 16**



**Source: Bloomberg Finance L.P.**

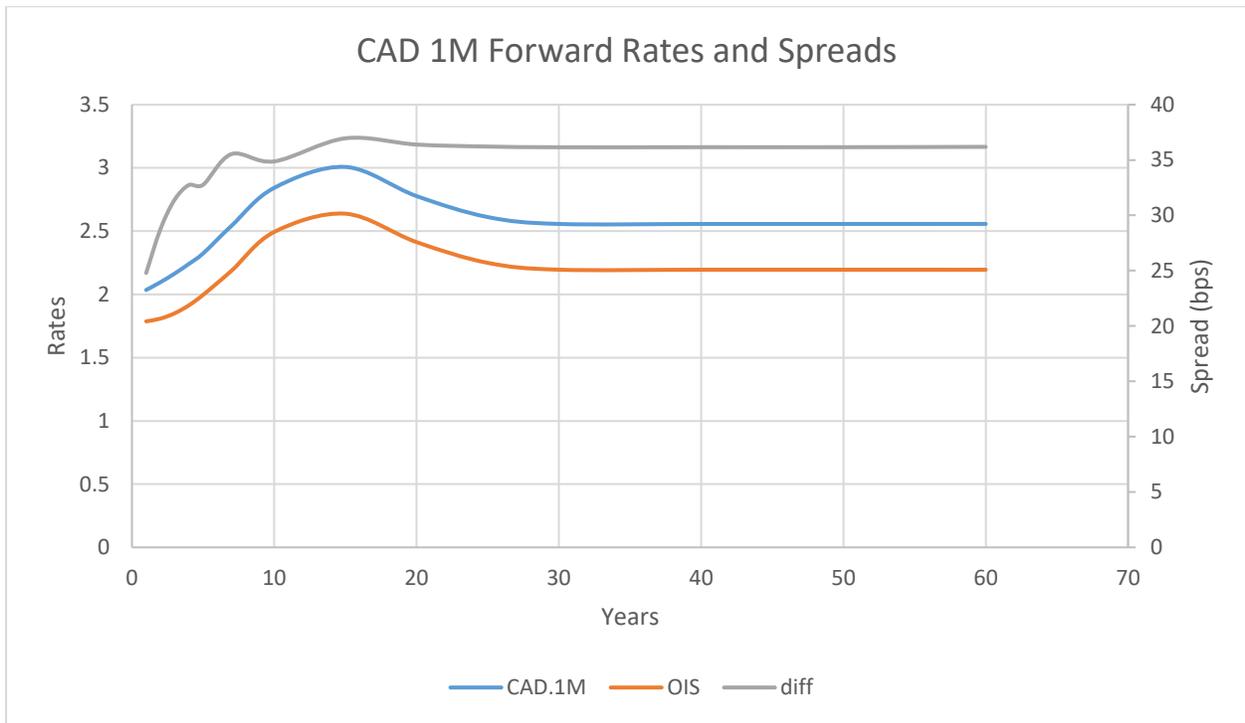
**Graph 17**



**Source: Bloomberg Finance L.P.**

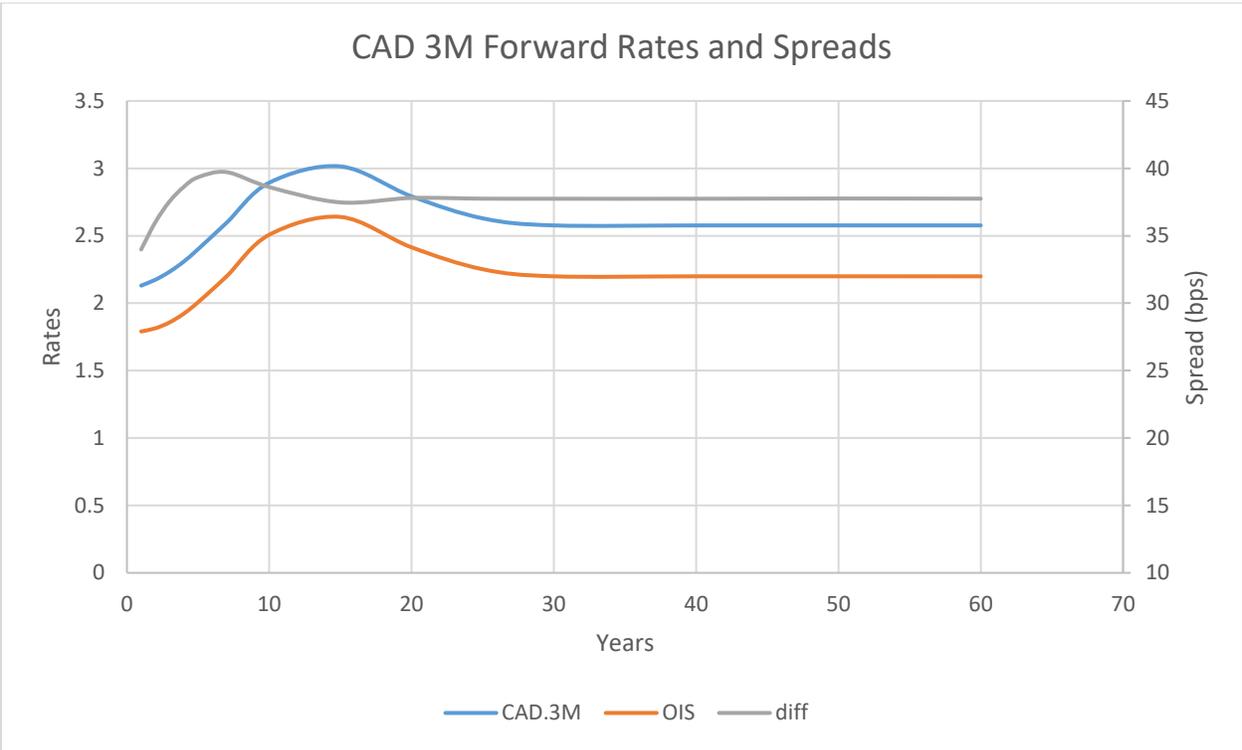
# CAD (CORRA)

## Graph 18



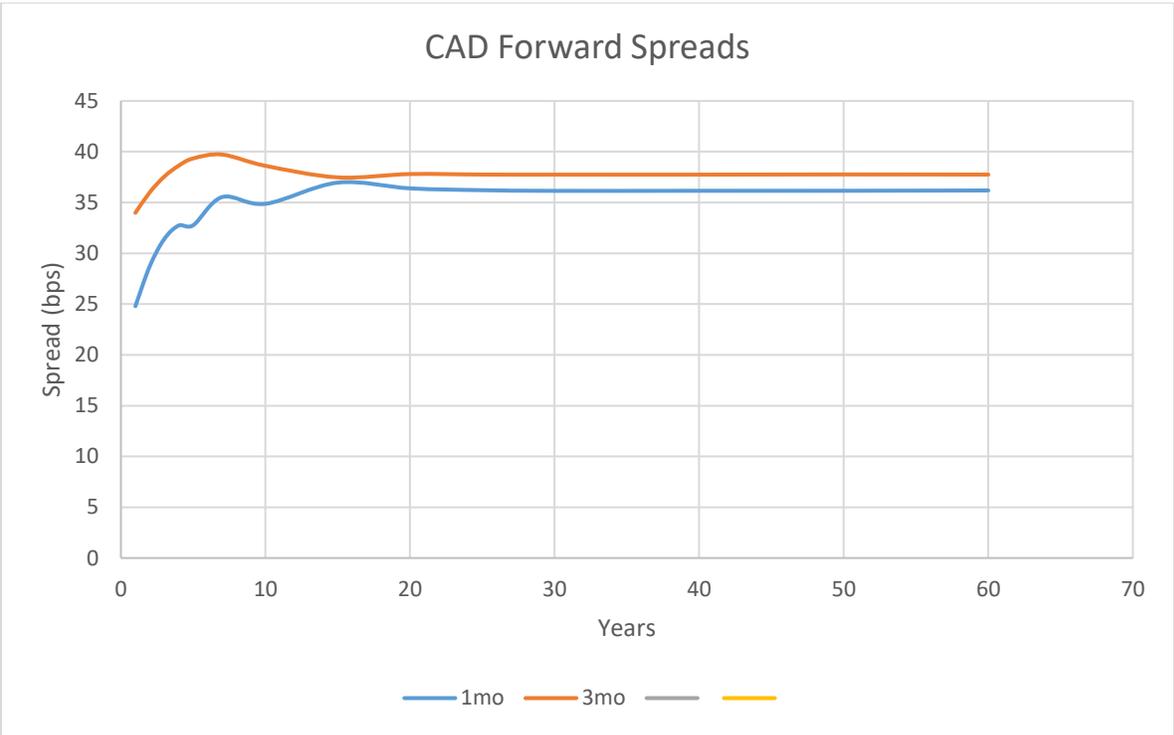
Source: Bloomberg Finance L.P.

**Graph 19**



**Source: Bloomberg Finance L.P.**

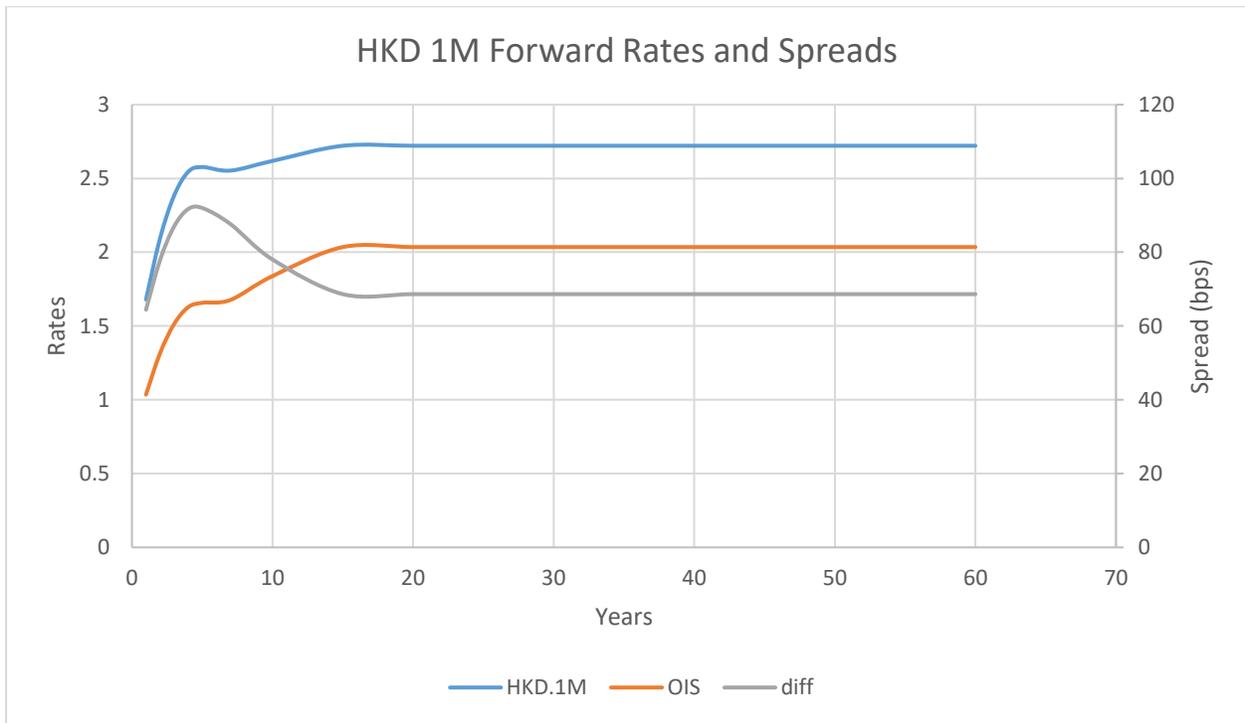
**Graph 20**



**Source: Bloomberg Finance L.P.**

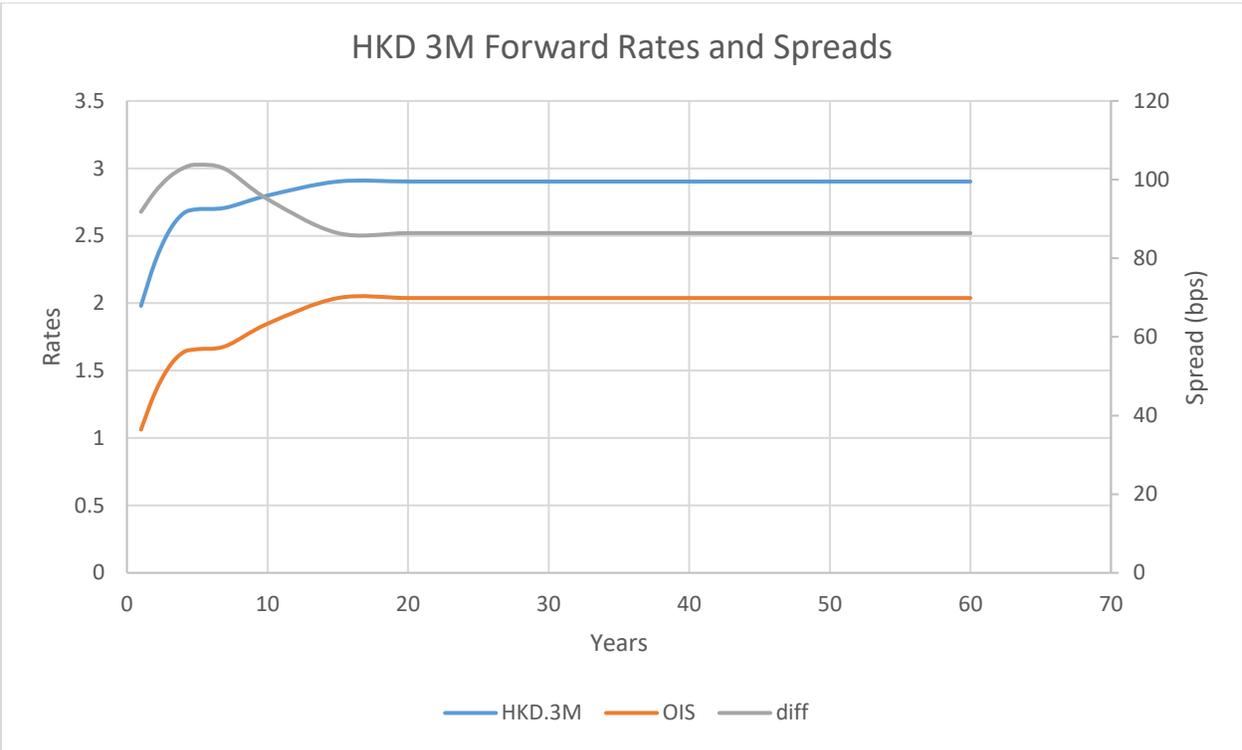
## HKD (HONIA)

Graph 21



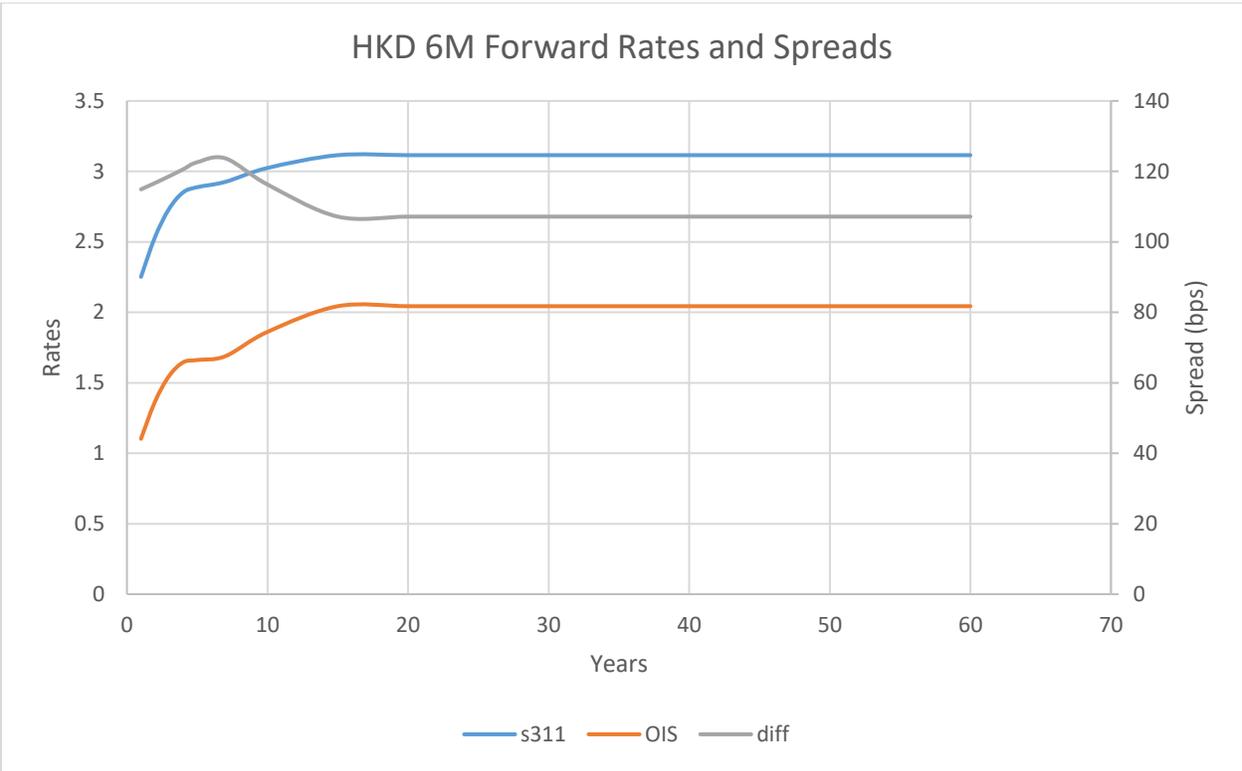
Source: Bloomberg Finance L.P.

**Graph 22**



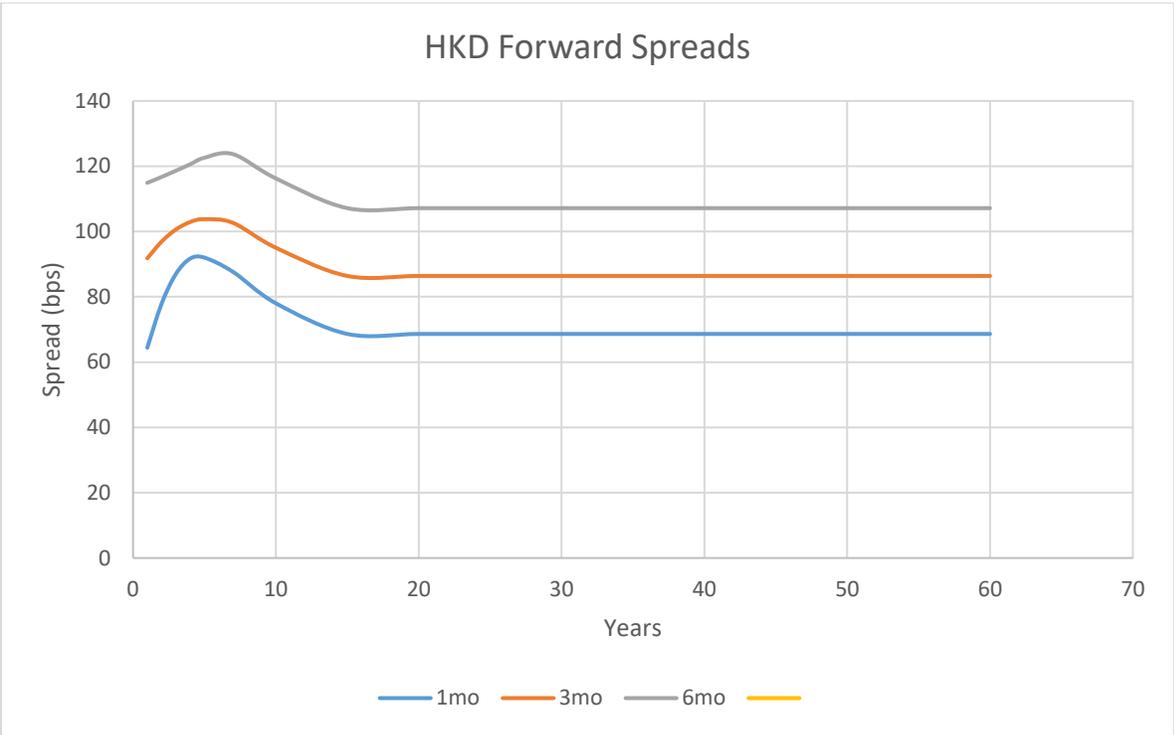
**Source: Bloomberg Finance L.P.**

**Graph 23**



**Source: Bloomberg Finance L.P.**

**Graph 24**



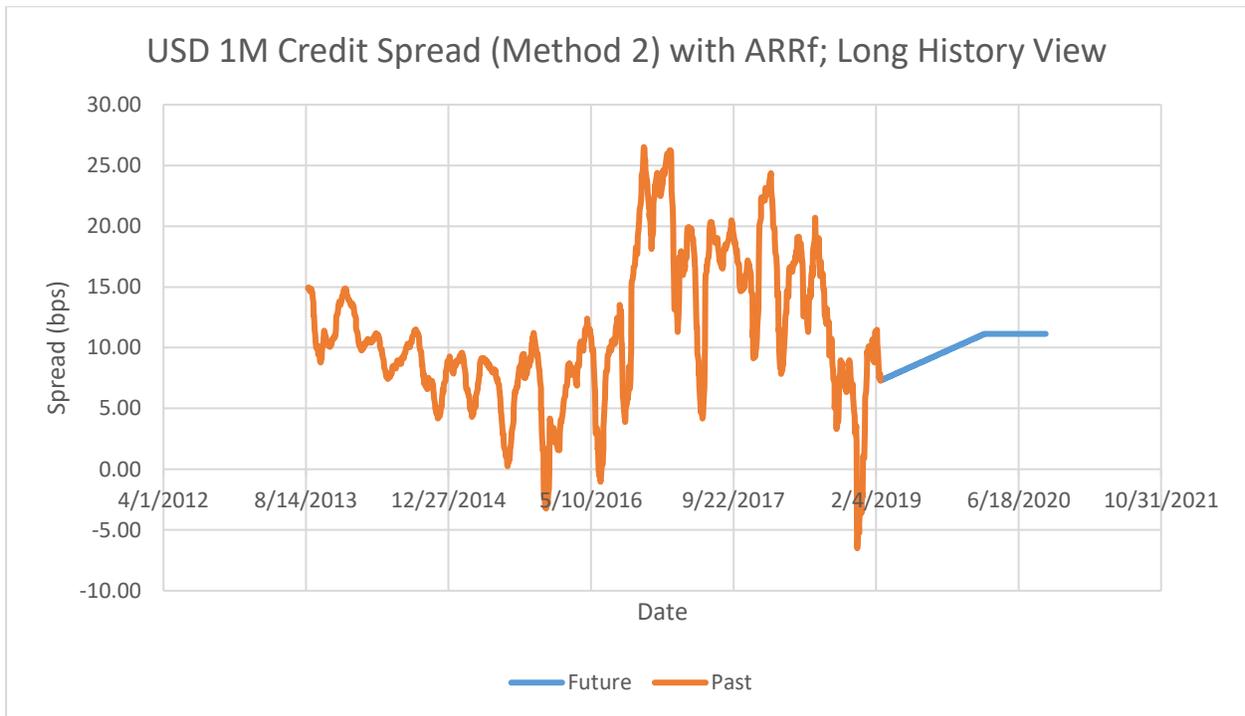
**Source: Bloomberg Finance L.P.**

## **Historical Mean/Median Approach**

**Graphs 25 through 36 illustrate an average (mean) spread over the past five years for the 1-month and 6-month IBOR tenors, with linear interpolation/extrapolation over the next year (i.e., the "transitional period"), and beyond that, constant extrapolation to the mean. These are all based on the compounded setting in arrears rate.**

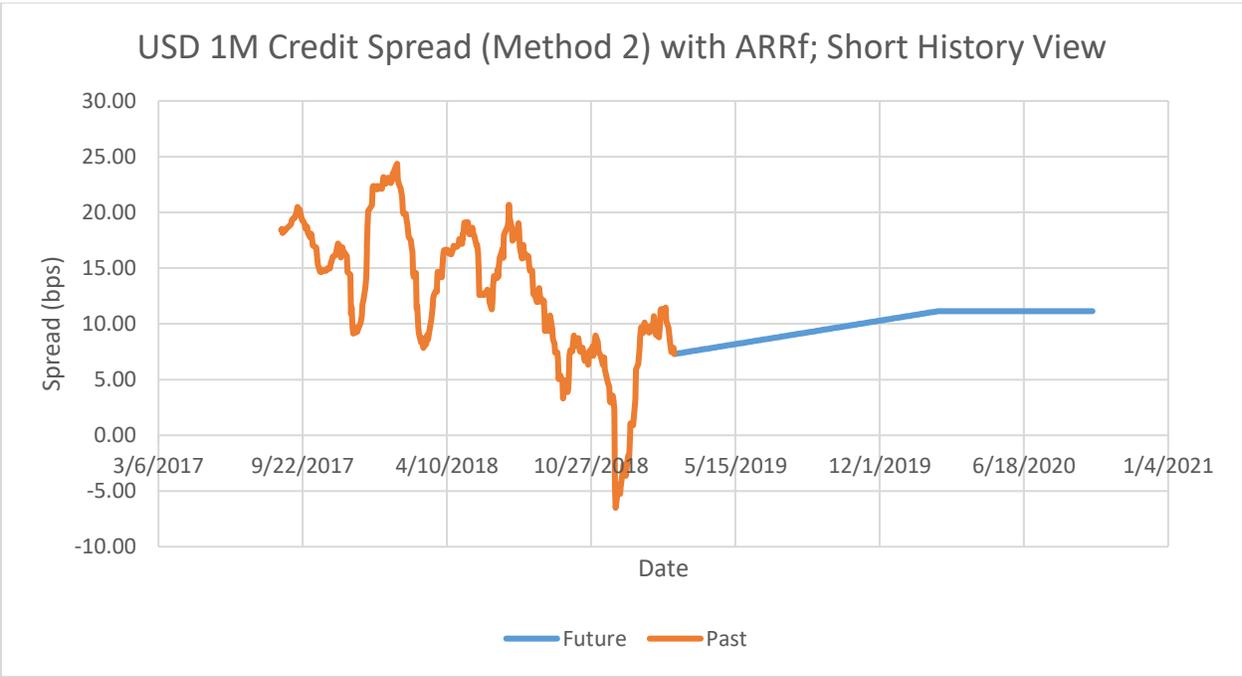
## USD (SOFR)

Graph 25



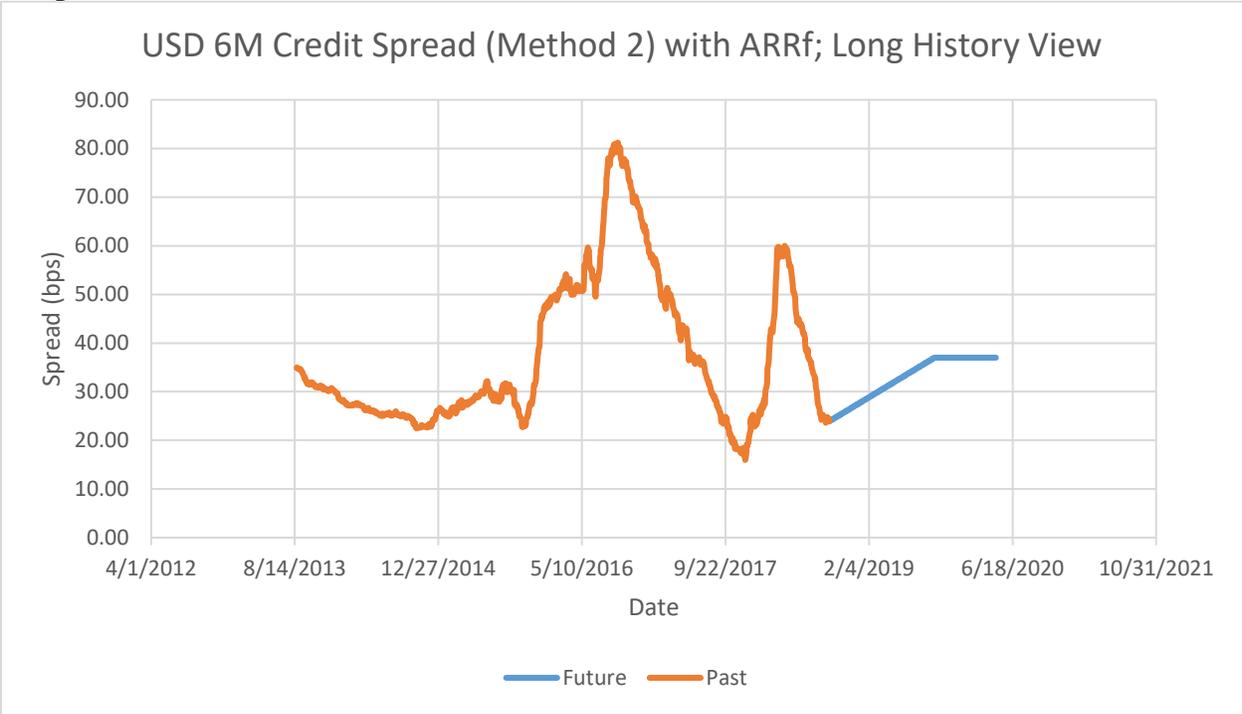
Source: Bloomberg Finance L.P.

**Graph 26**



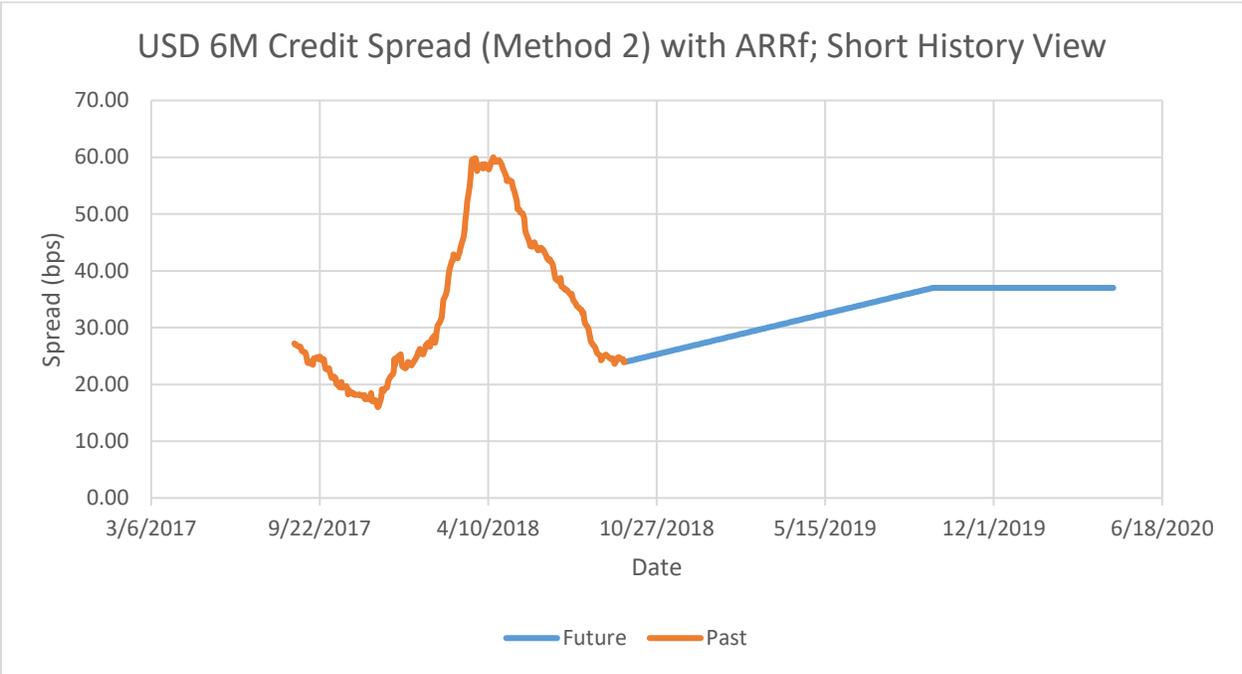
**Source: Bloomberg Finance L.P.**

**Graph 27**



**Source: Bloomberg Finance L.P.**

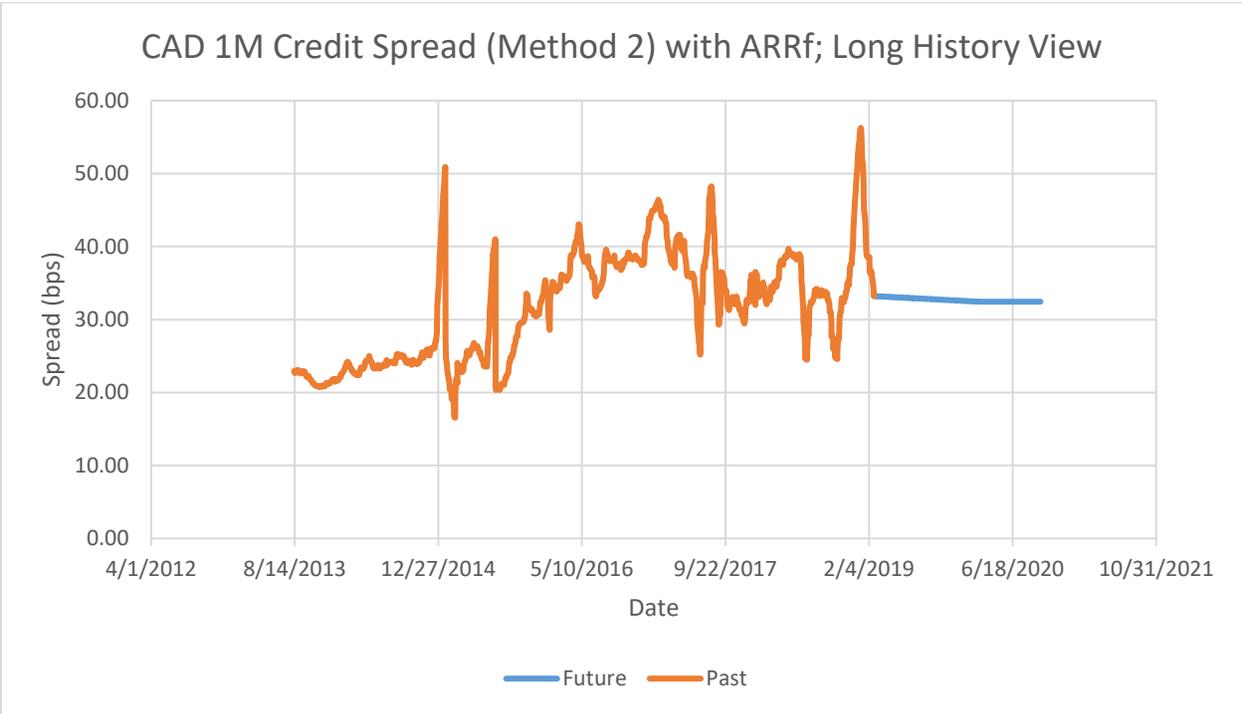
**Graph 28**



**Source: Bloomberg Finance L.P.**

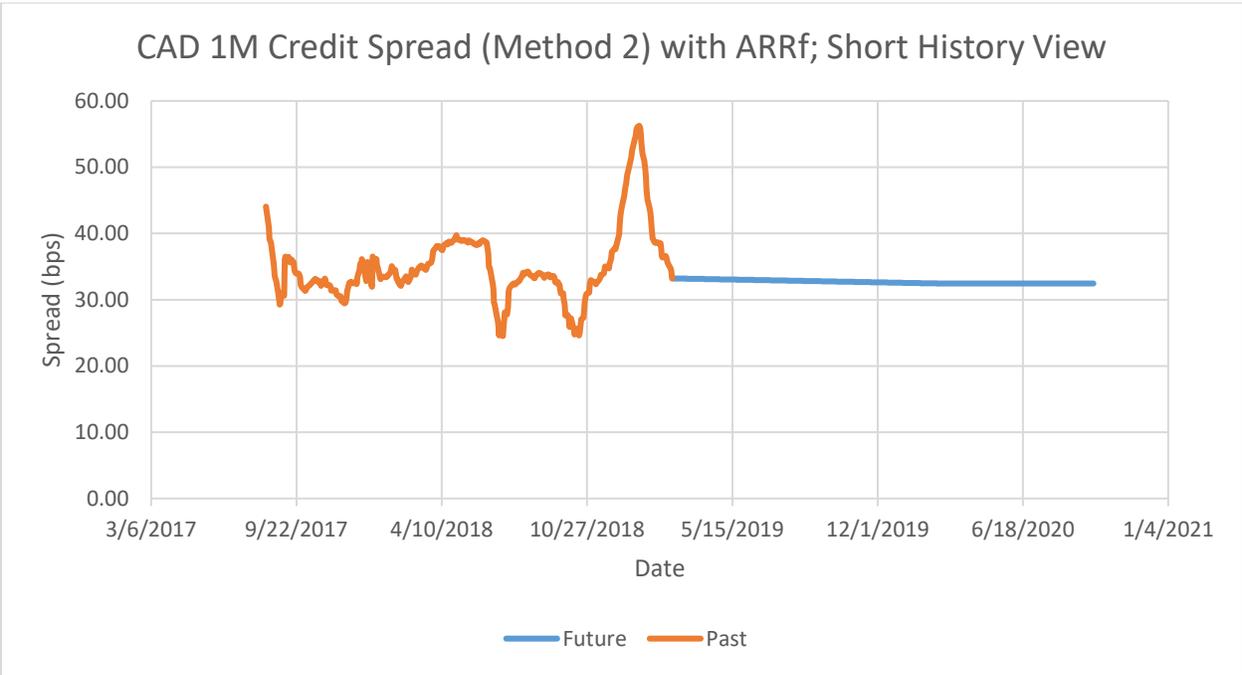
**CAD (CORRA)**

**Graph 29**



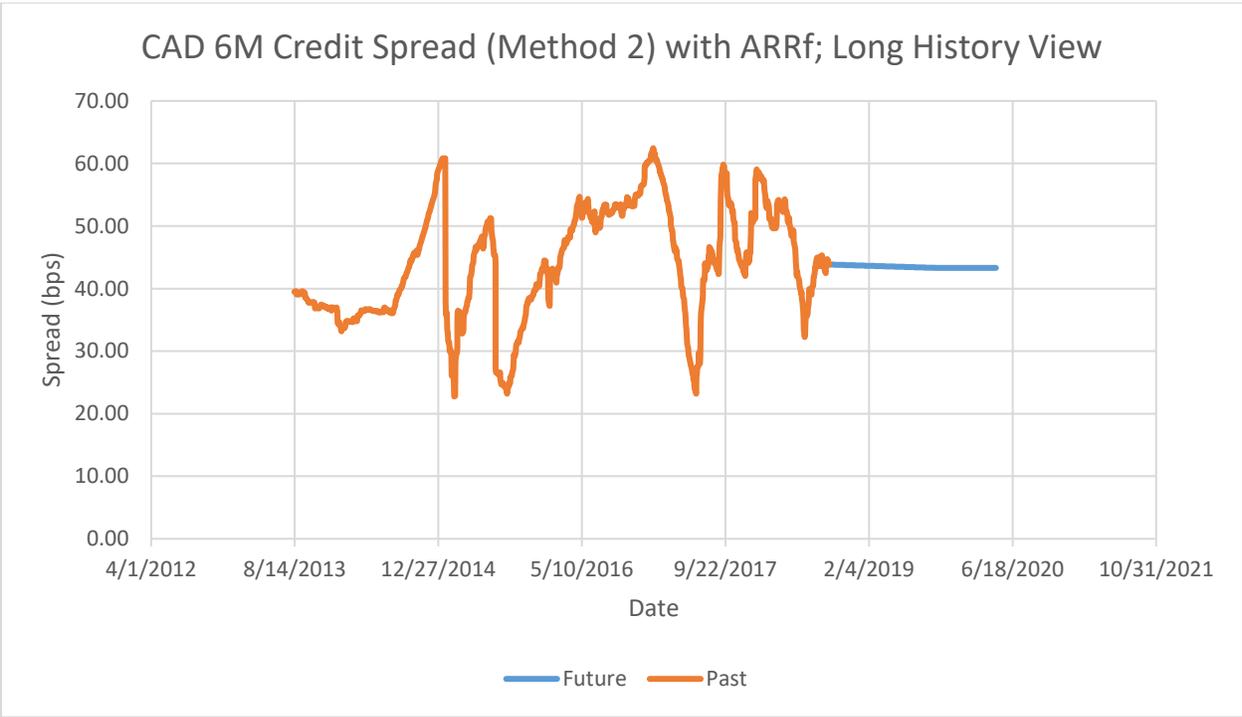
**Source: Bloomberg Finance L.P.**

**Graph 30**



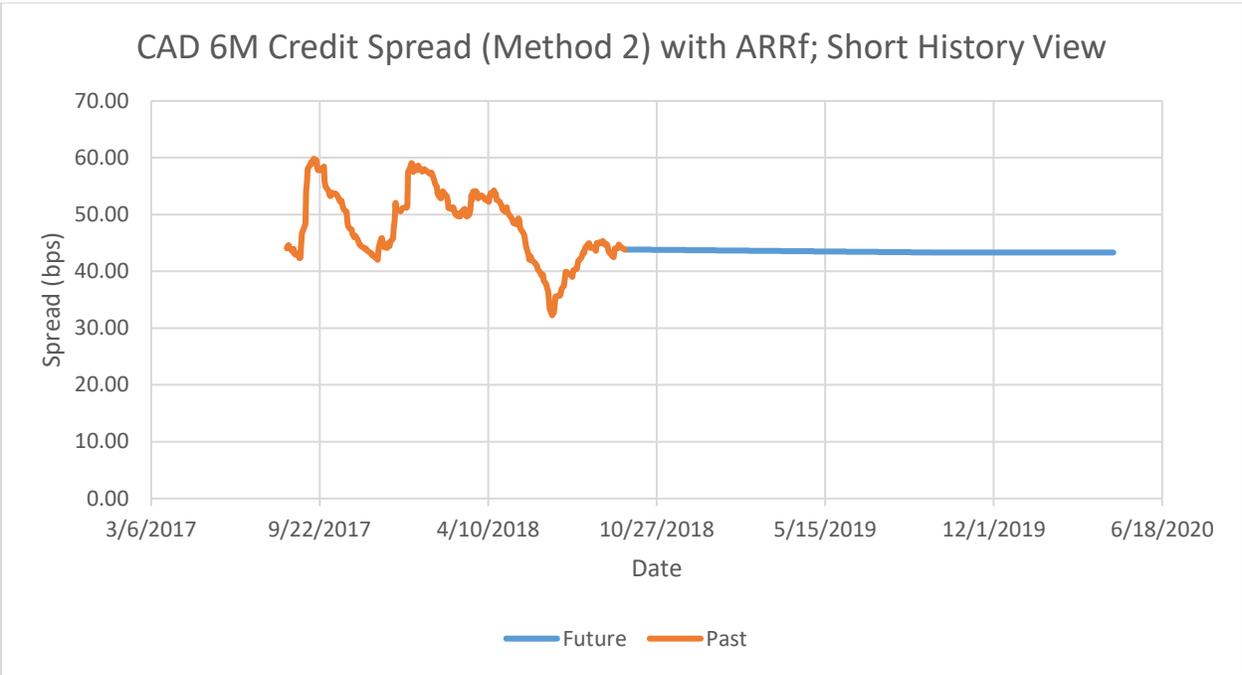
**Source: Bloomberg Finance L.P.**

**Graph 31**



**Source: Bloomberg Finance L.P.**

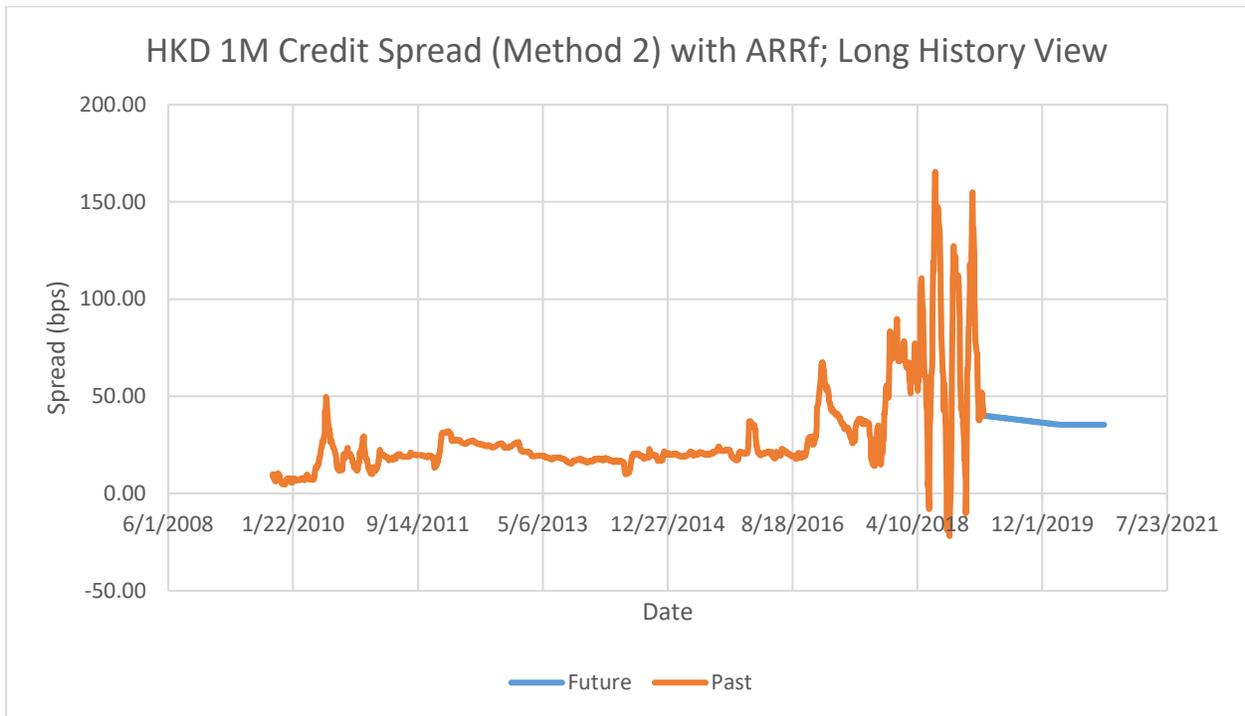
**Graph 32**



**Source: Bloomberg Finance L.P.**

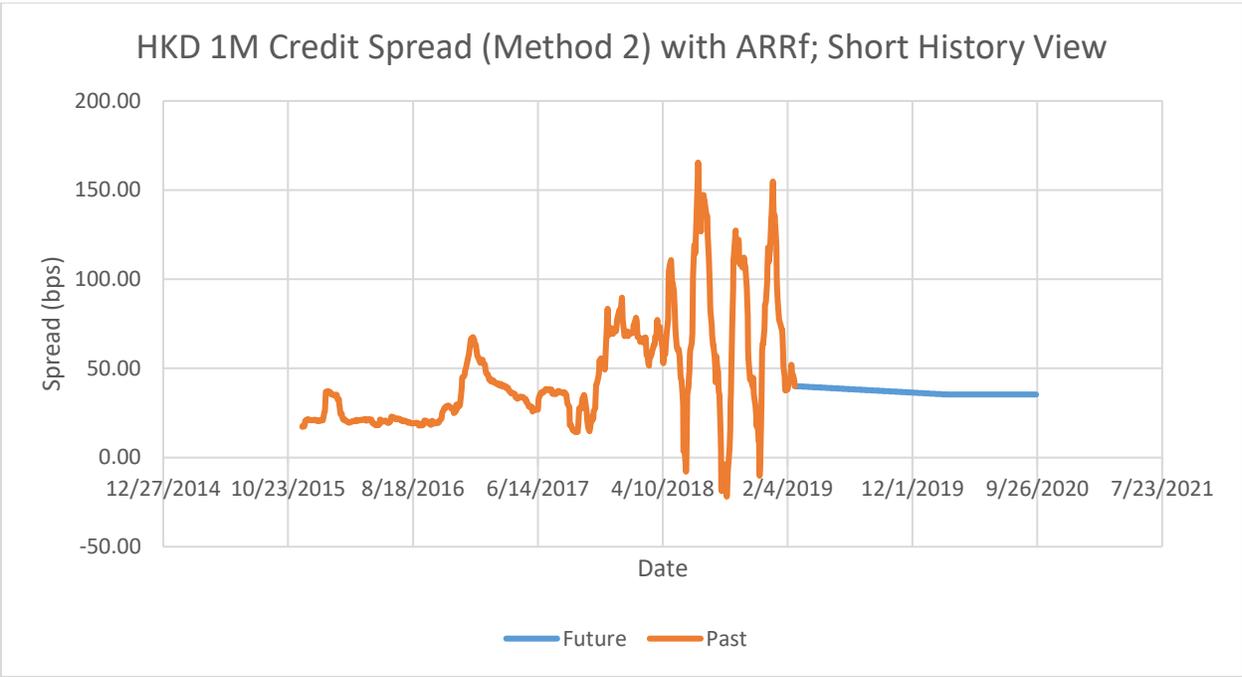
## HKD (HONIA)

Graph 33



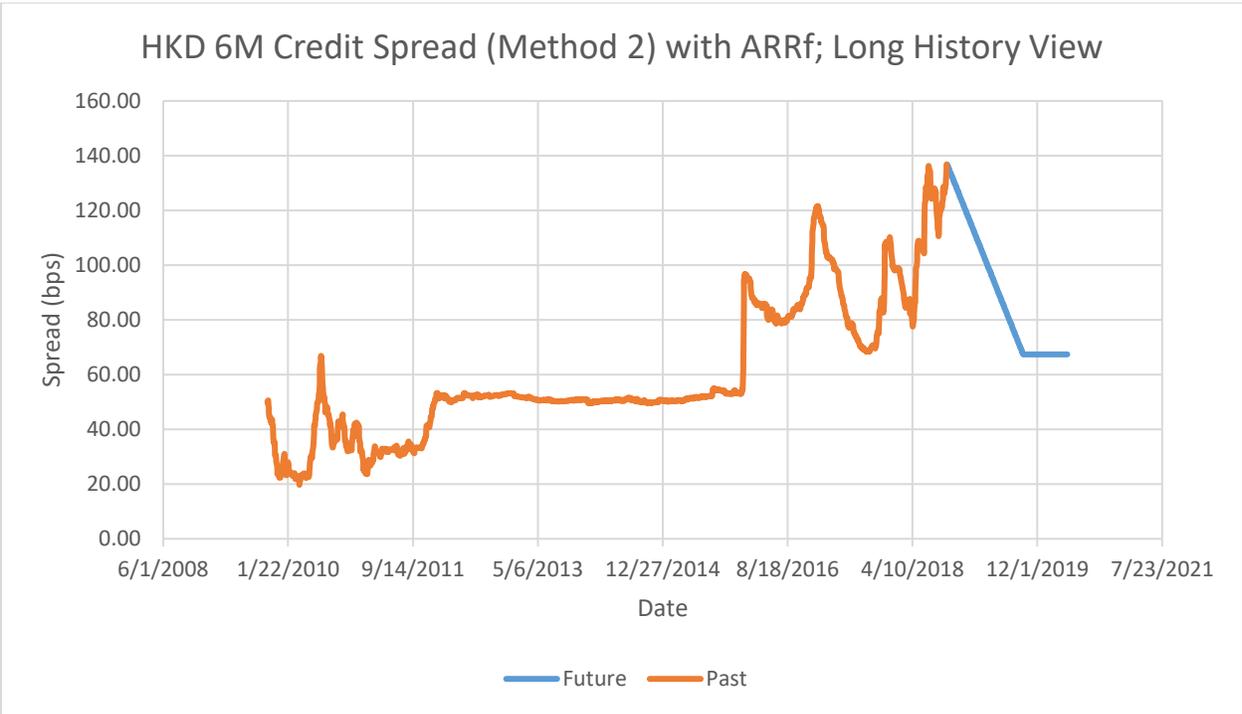
Source: Bloomberg Finance L.P.

**Graph 34**



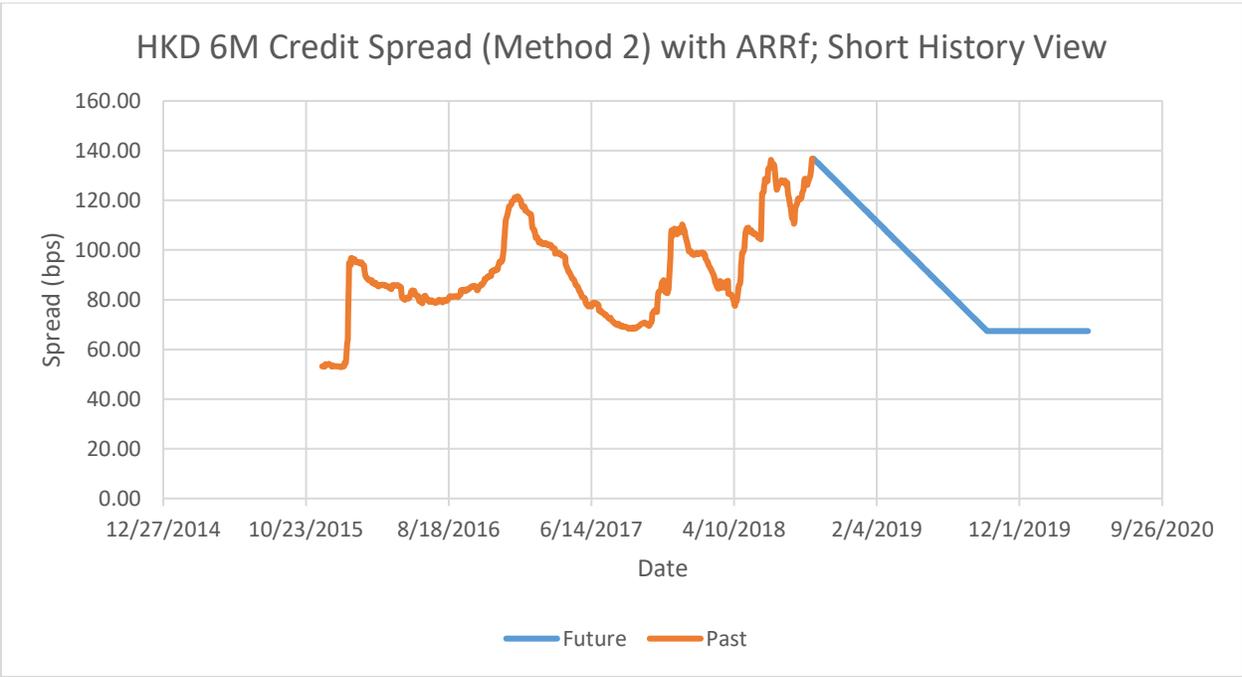
**Source: Bloomberg Finance L.P.**

**Graph 35**



**Source: Bloomberg Finance L.P.**

**Graph 36**



**Source: Bloomberg Finance L.P.**

## Spot-Spread Approach

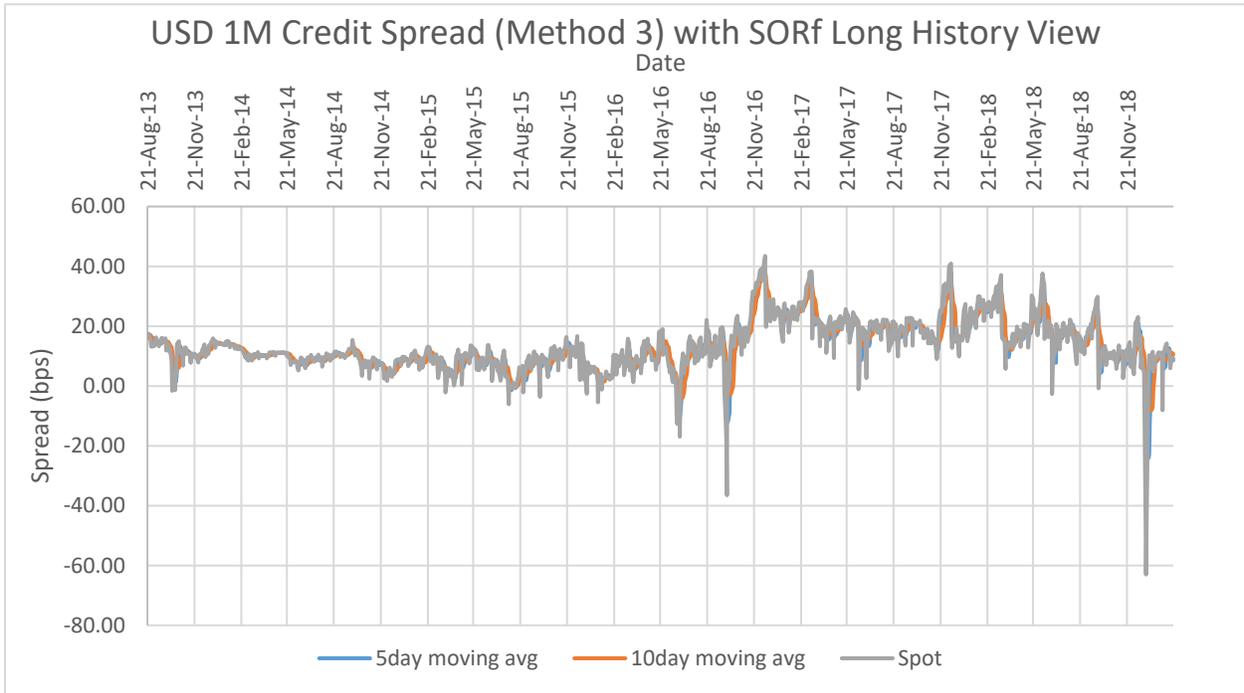
Graphs 37 through 60 illustrate the spot-spread approach over the past five years, based upon 10-day, 5-day, and 1-day (i.e., "spot") moving averages.

Graphs 37 through 48 are based on the spot overnight rate.

Graphs 49 through 60 are based on the compounded setting in arrears rate. Please note that ISDA does not contemplate implementing the compounded setting in arrears rate with the spot-spread approach. Therefore these graphs are provided only for purposes of comparing the spot-spread approach to the historical mean/median approach and the forward approach (both of which are illustrated above based on the compounded in arrears rate).

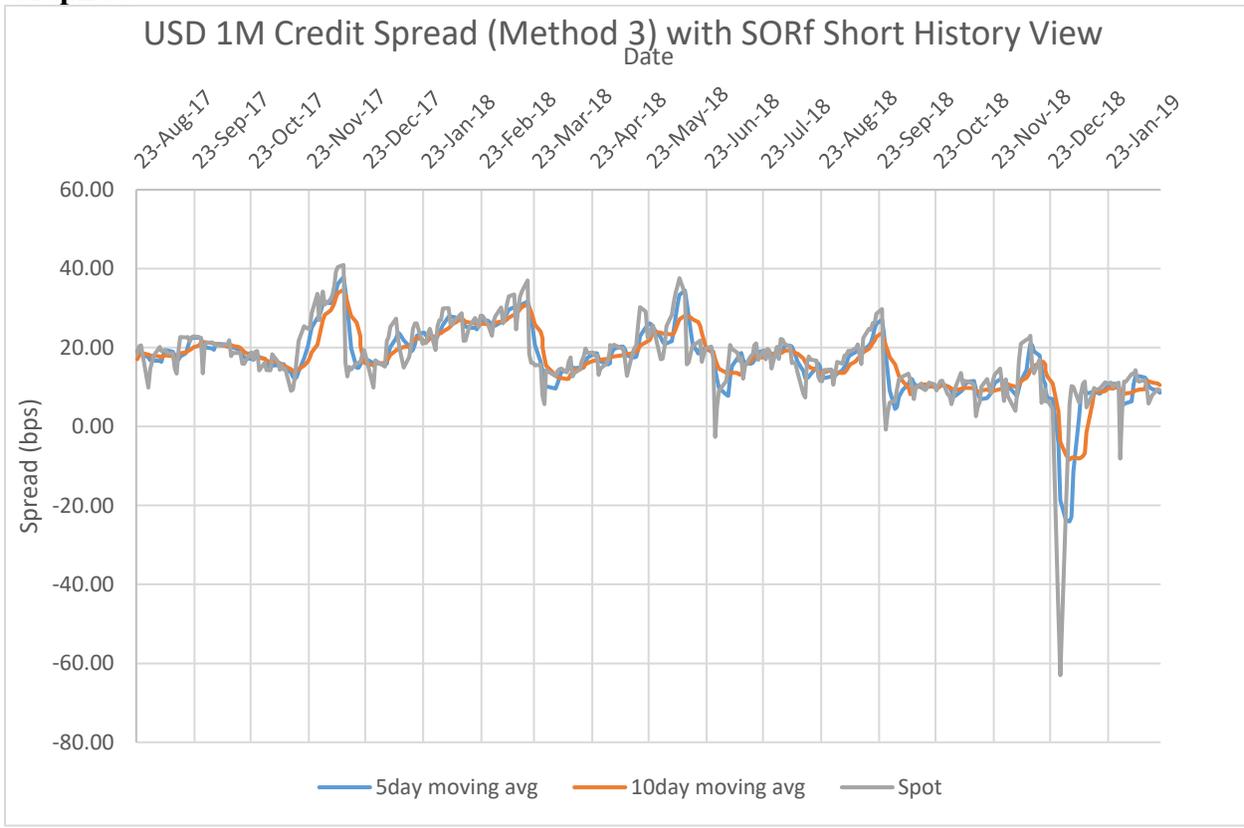
# USD (SOFR)

## Graph 37



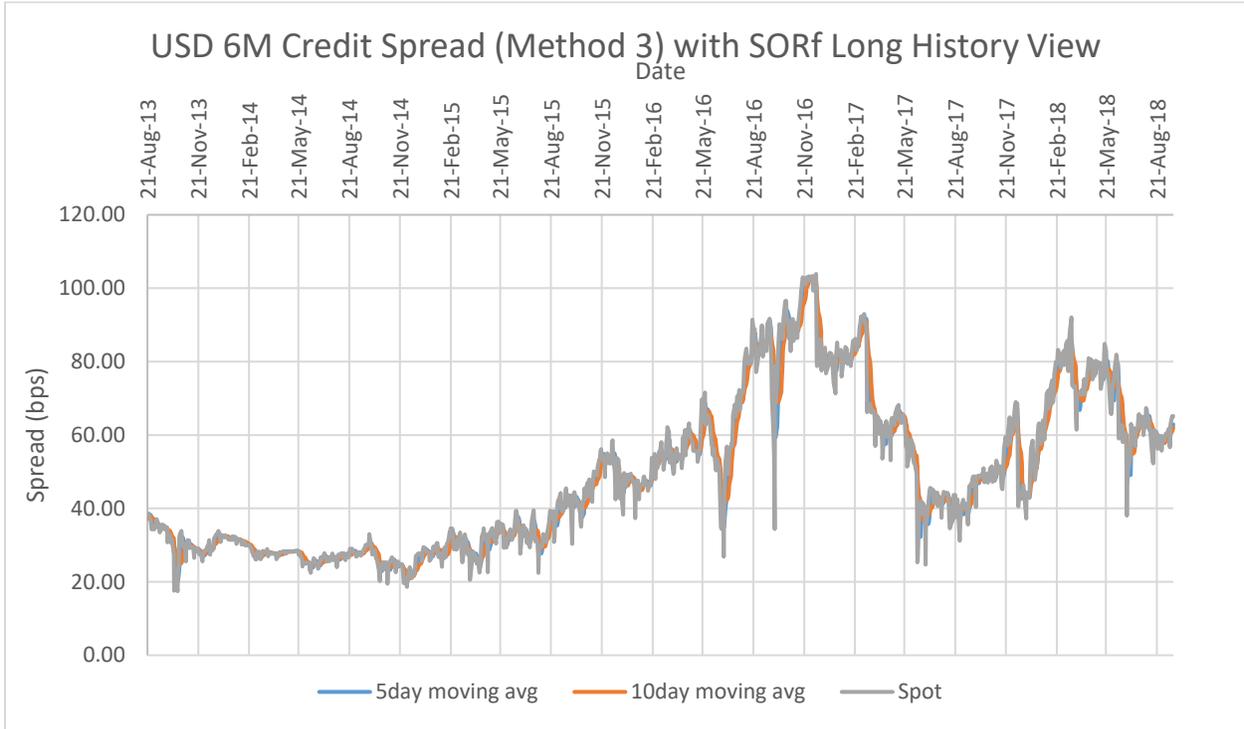
Source: Bloomberg Finance L.P.

**Graph 38**



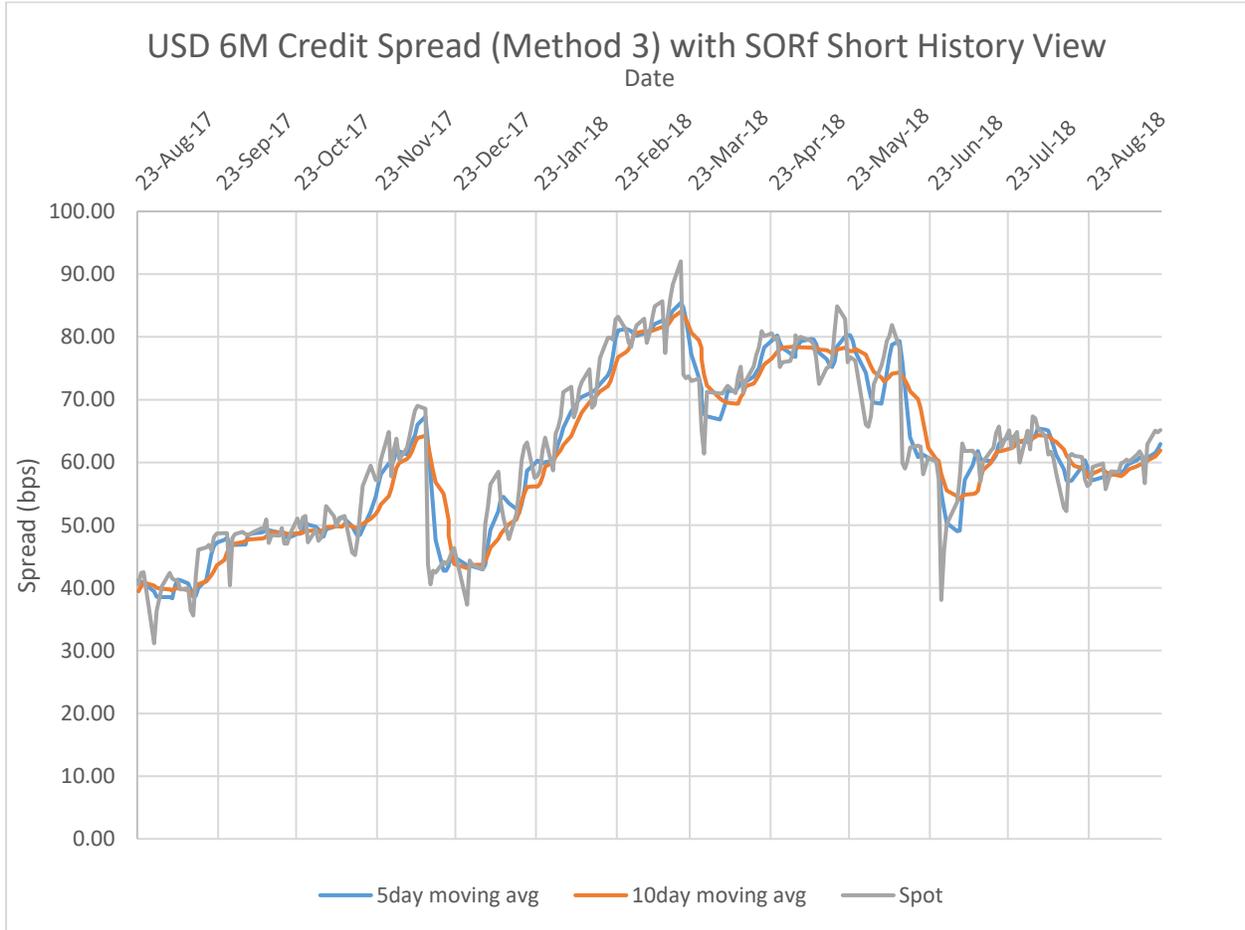
**Source: Bloomberg Finance L.P.**

**Graph 39**



**Source: Bloomberg Finance L.P.**

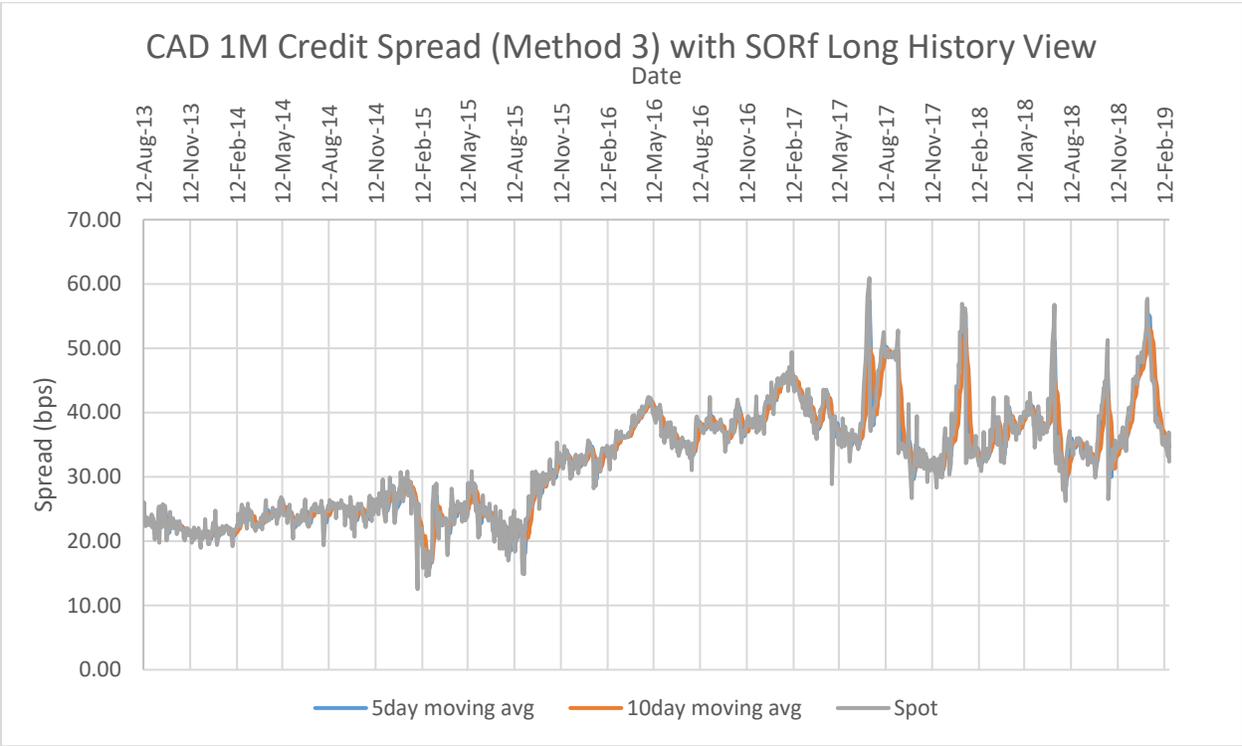
**Graph 40**



**Source: Bloomberg Finance L.P.**

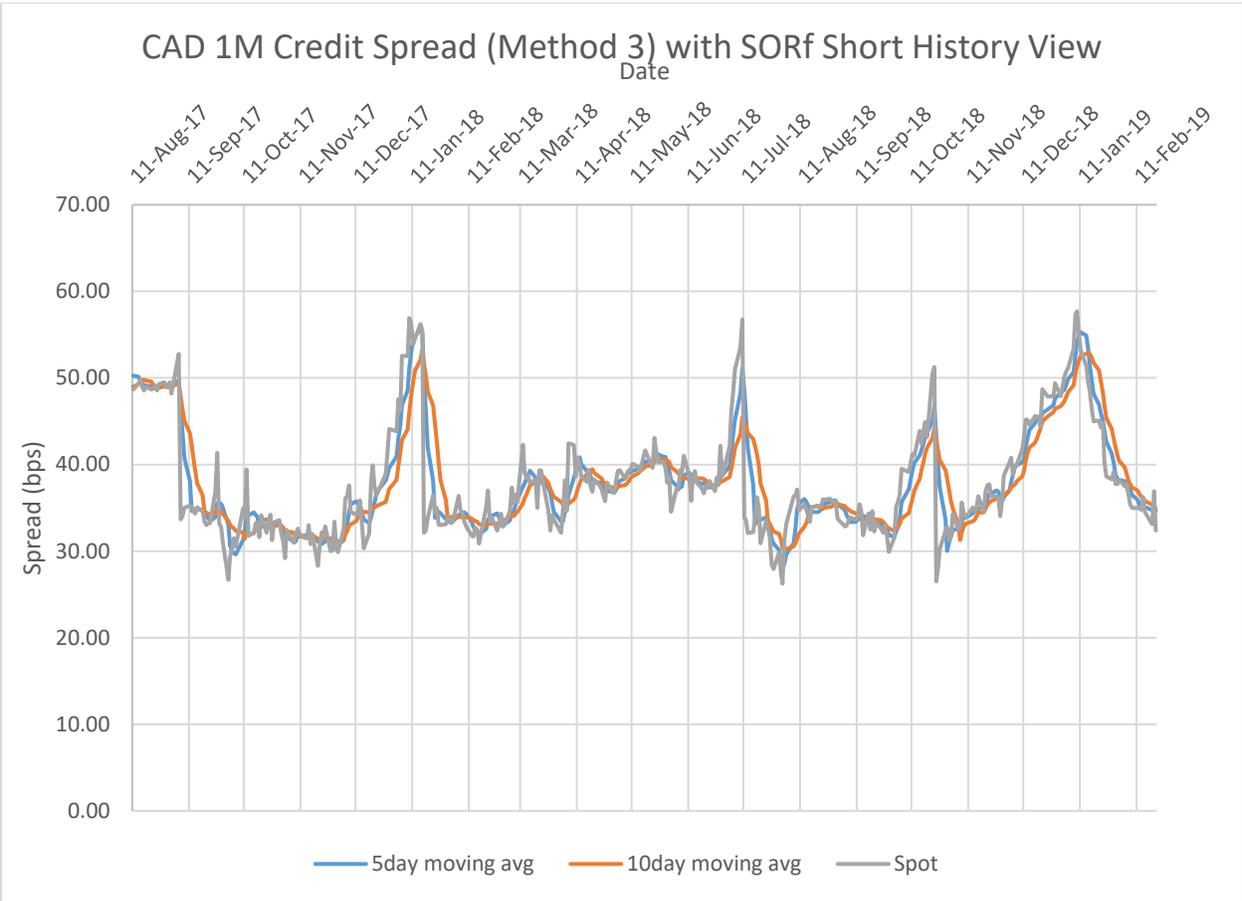
**CAD (CORRA)**

**Graph 41**



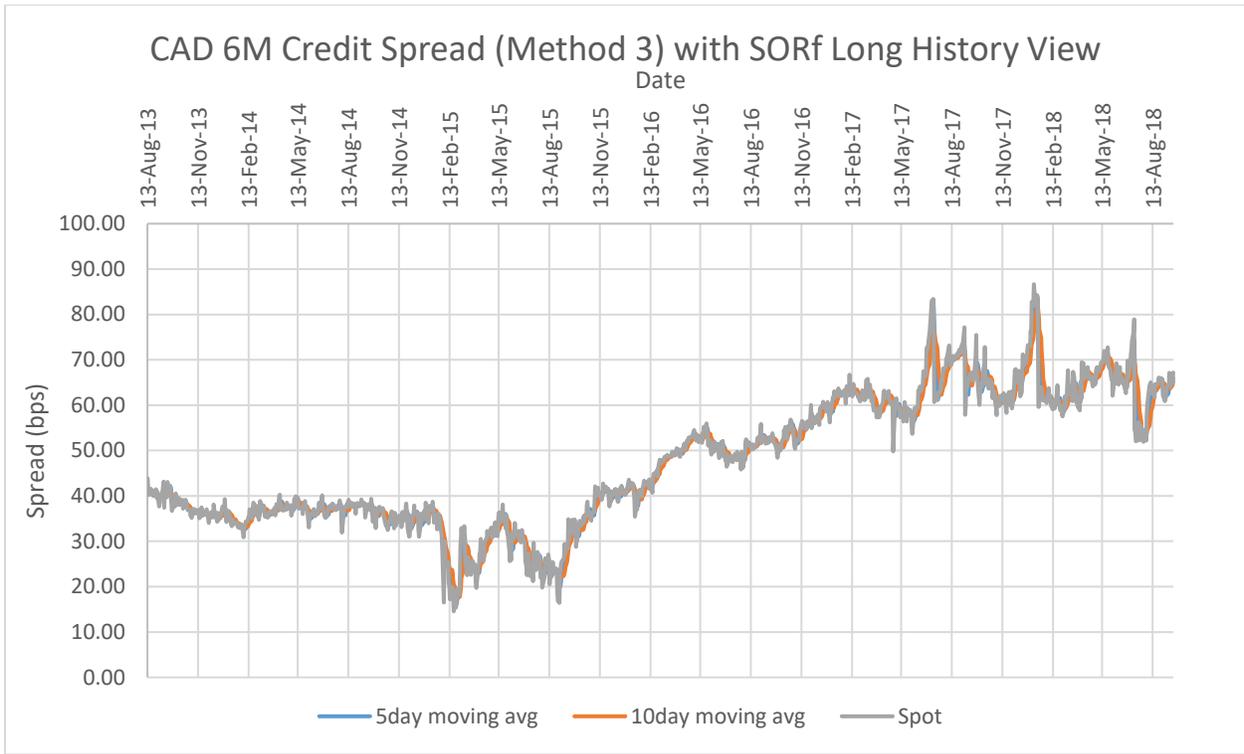
**Source: Bloomberg Finance L.P.**

**Graph 42**



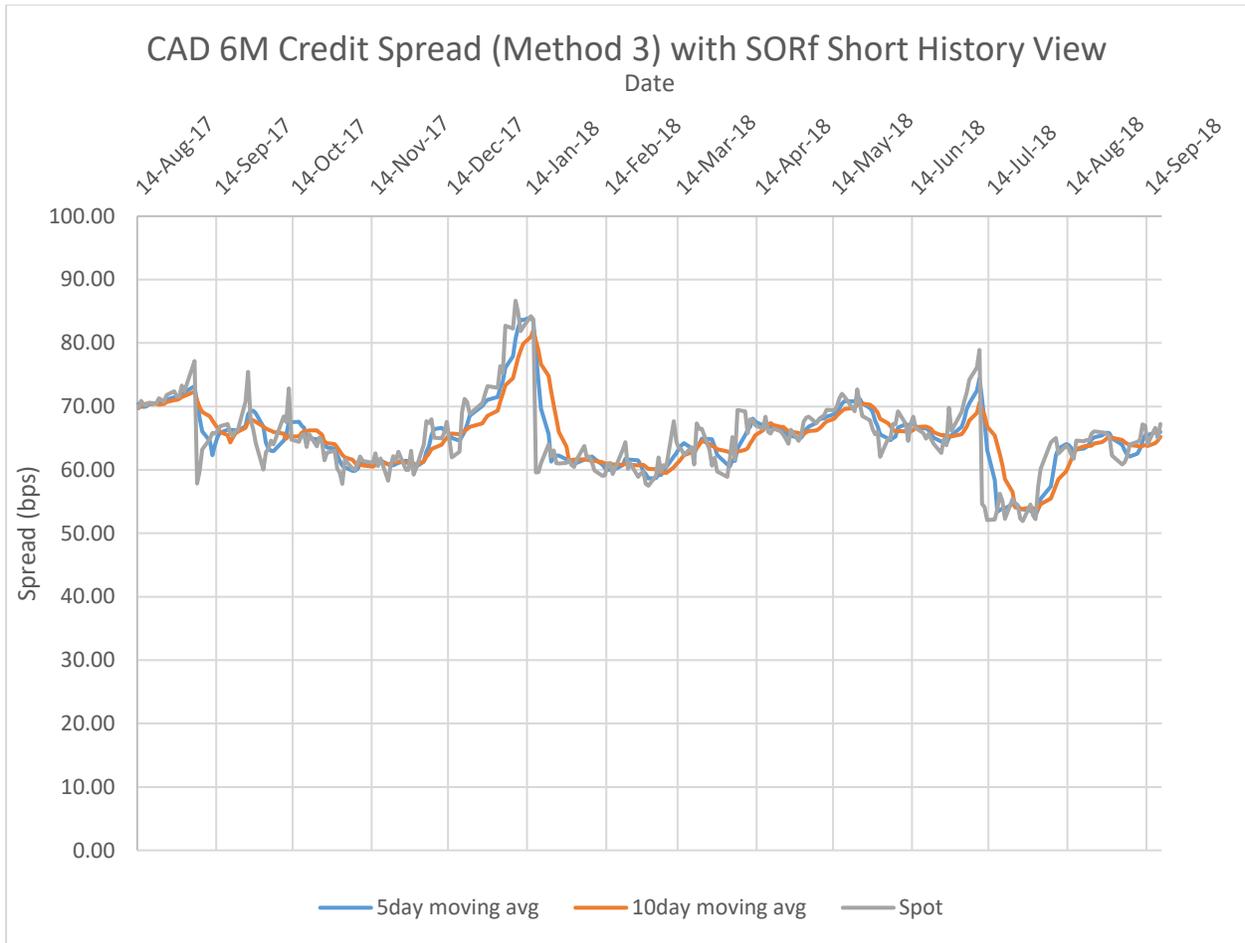
**Source: Bloomberg Finance L.P.**

**Graph 43**



**Source: Bloomberg Finance L.P.**

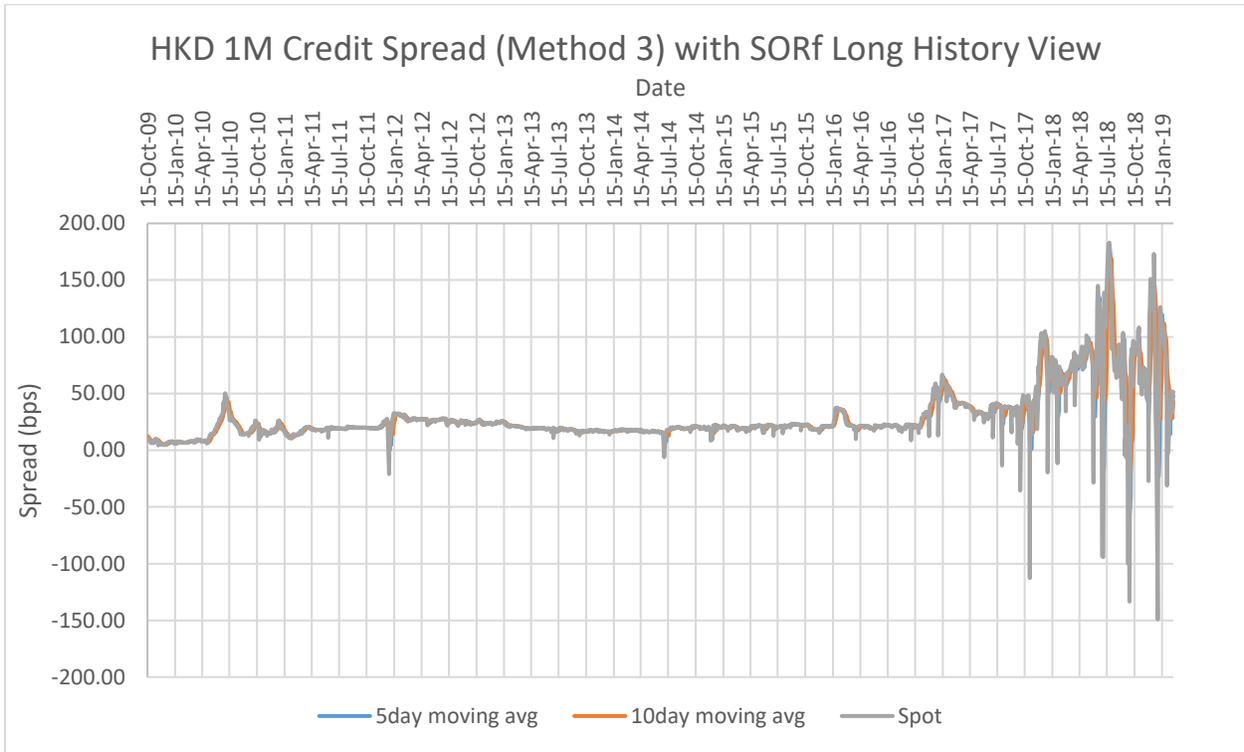
**Graph 44**



**Source: Bloomberg Finance L.P.**

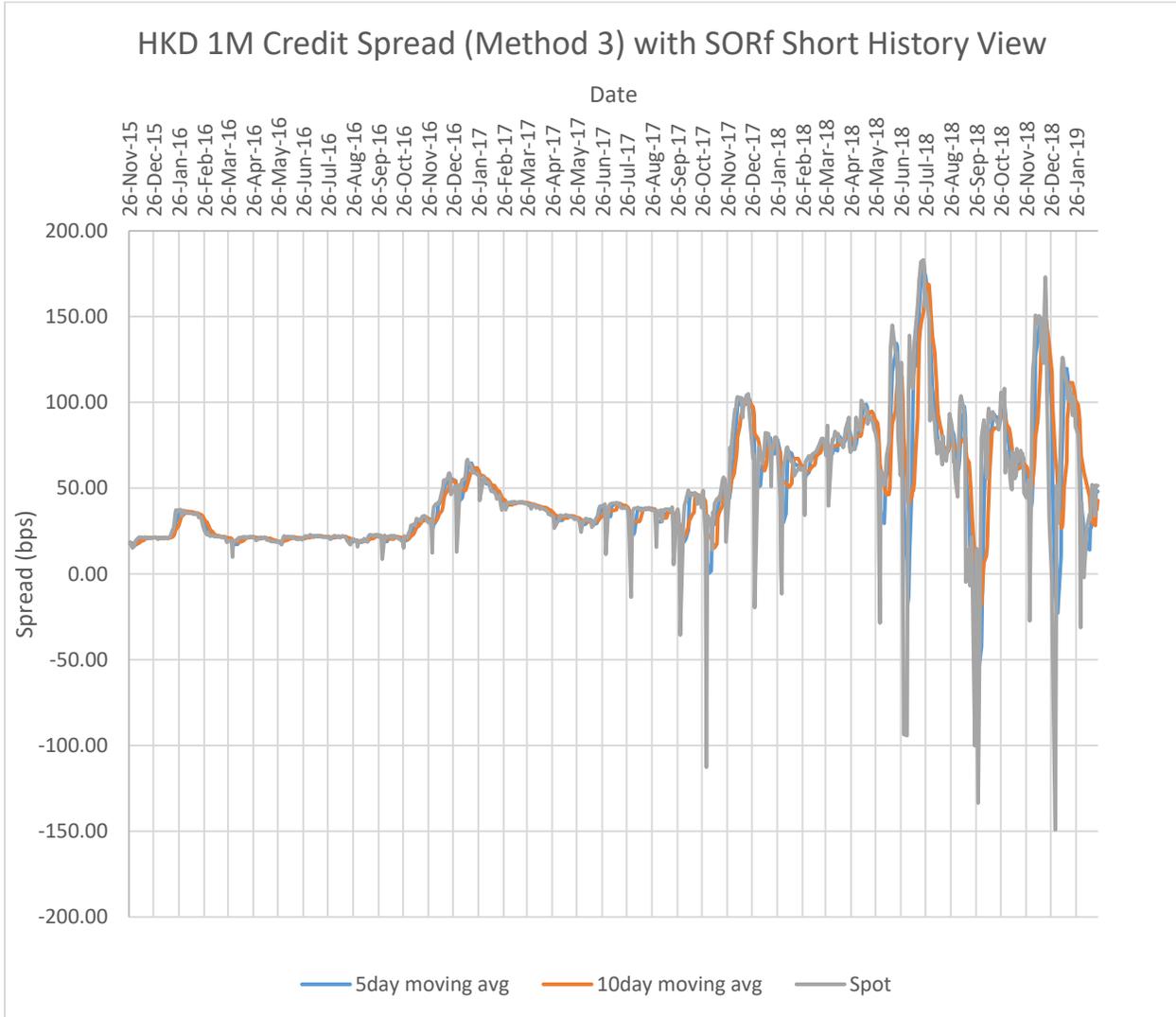
# HKD (HONIA)

## Graph 45



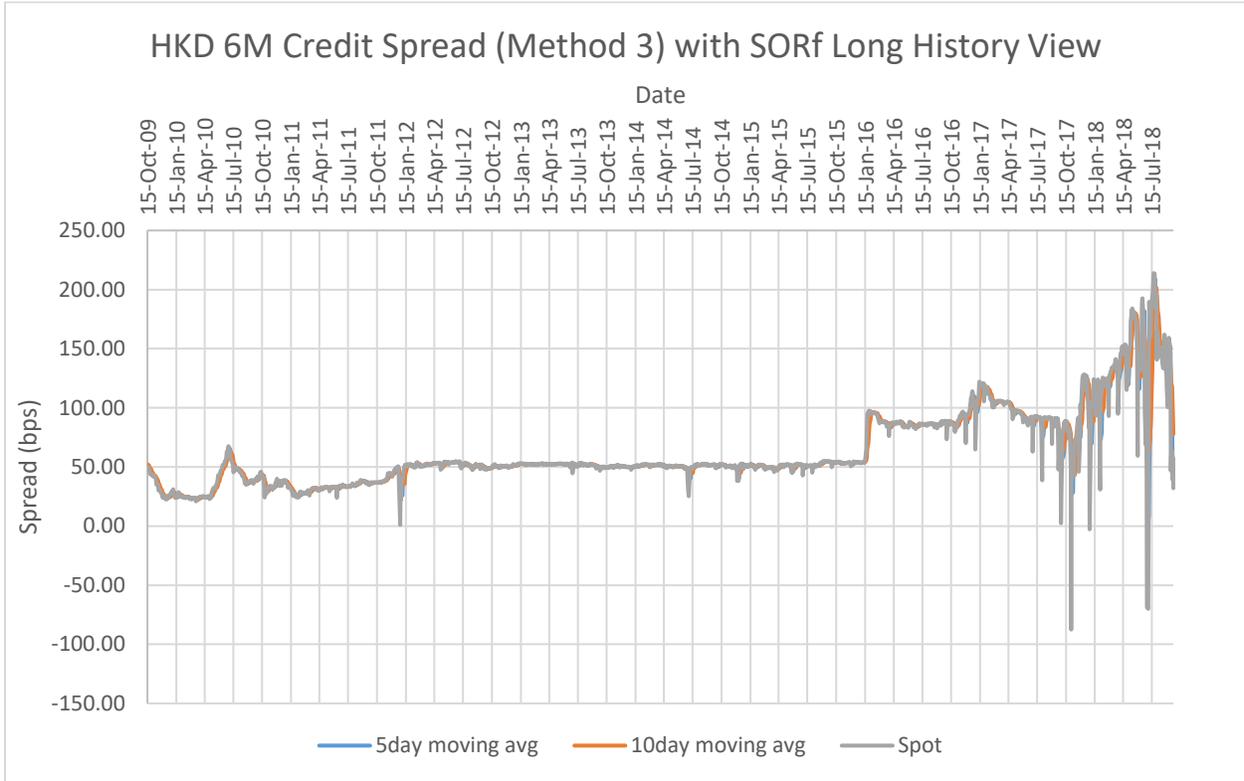
Source: Bloomberg Finance L.P.

**Graph 46**



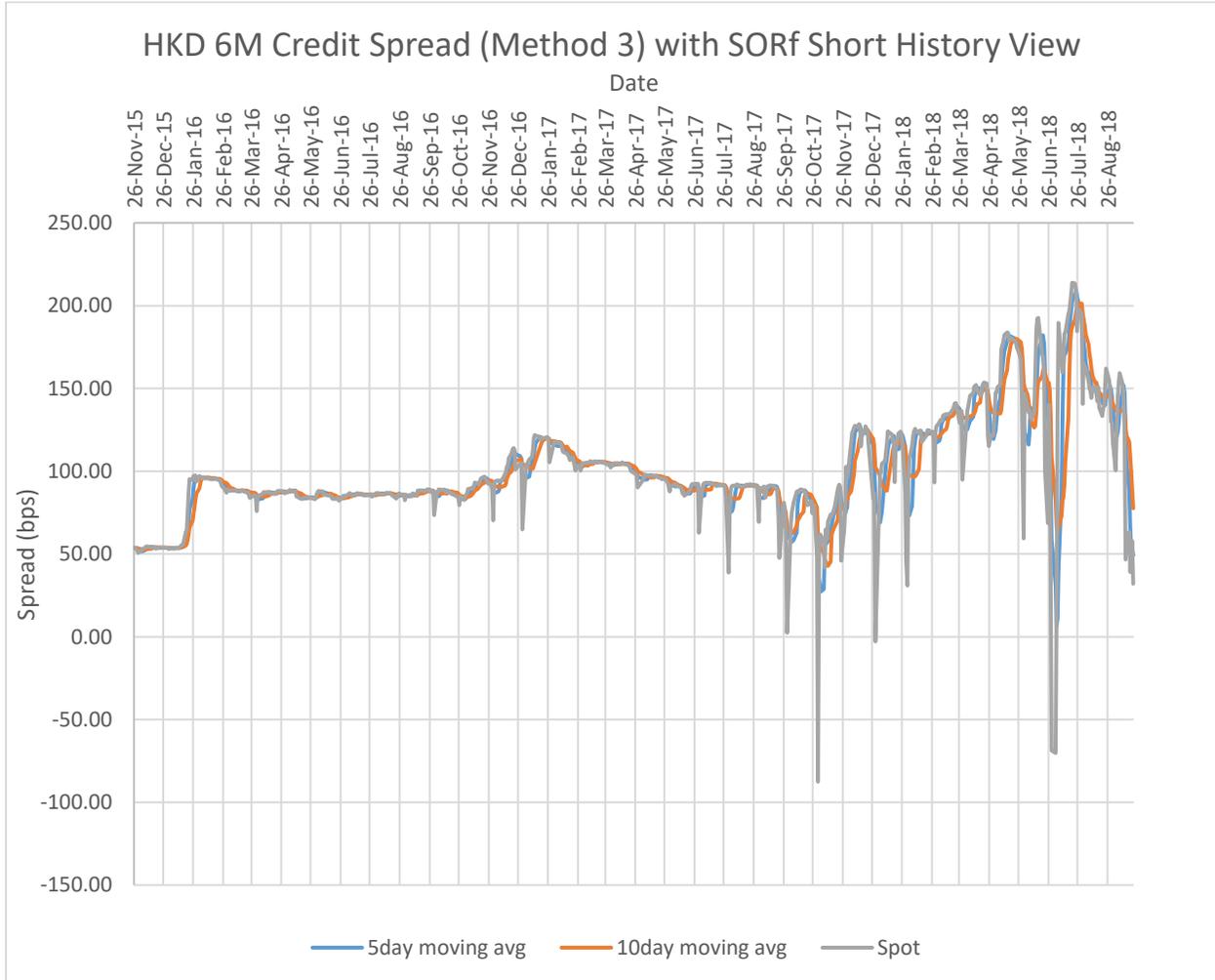
**Source: Bloomberg Finance L.P.**

**Graph 47**



**Source: Bloomberg Finance L.P.**

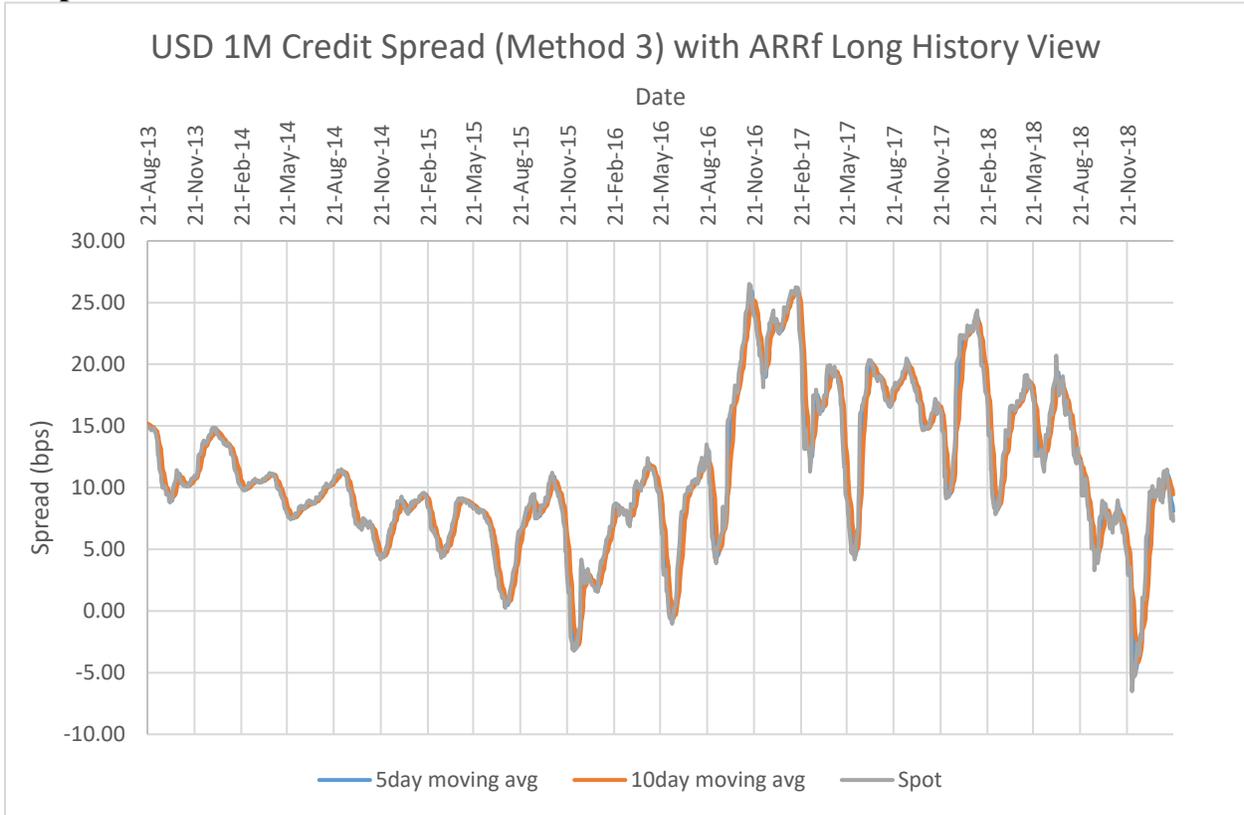
**Graph 48**



**Source: Bloomberg Finance L.P.**

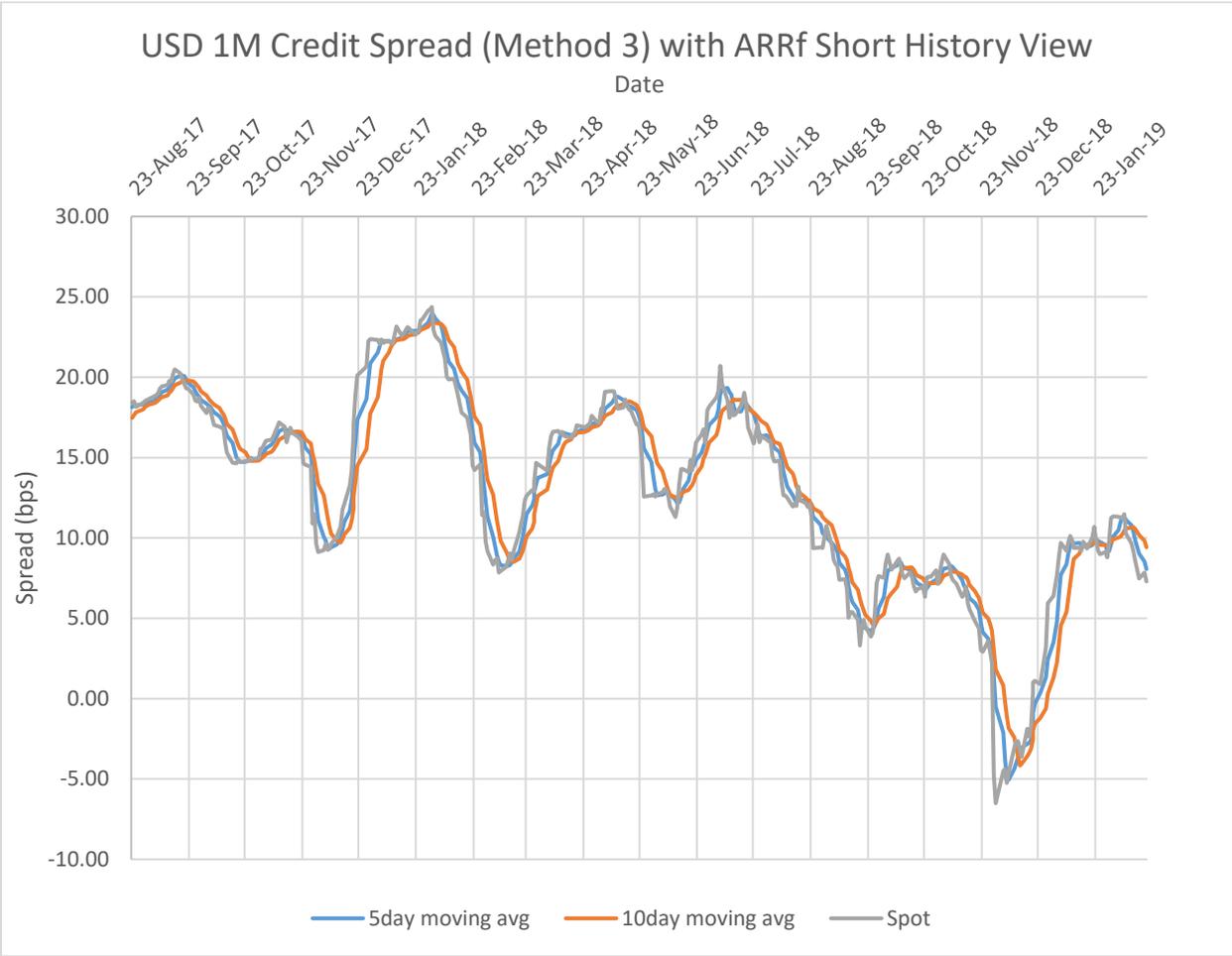
# USD (SOFR)

## Graph 49



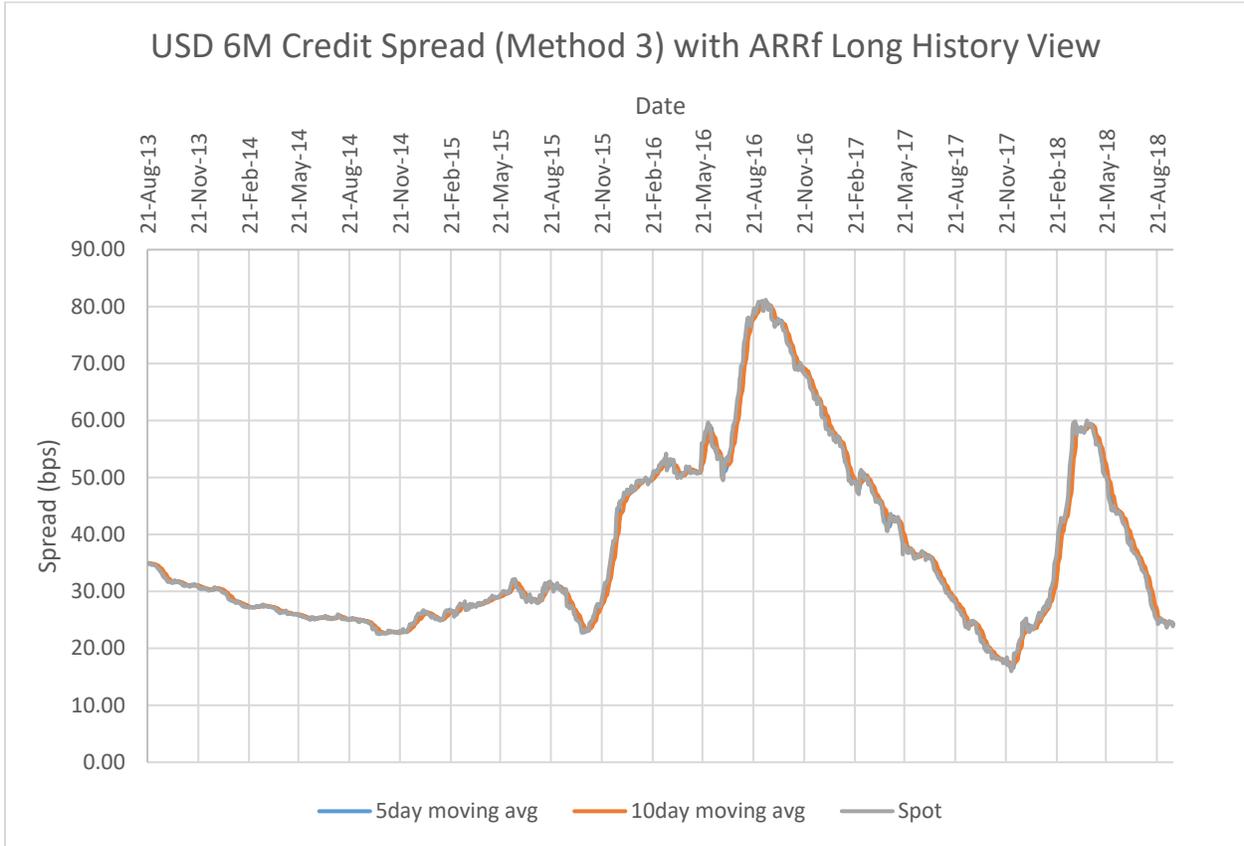
Source: Bloomberg Finance L.P.

**Graph 50**



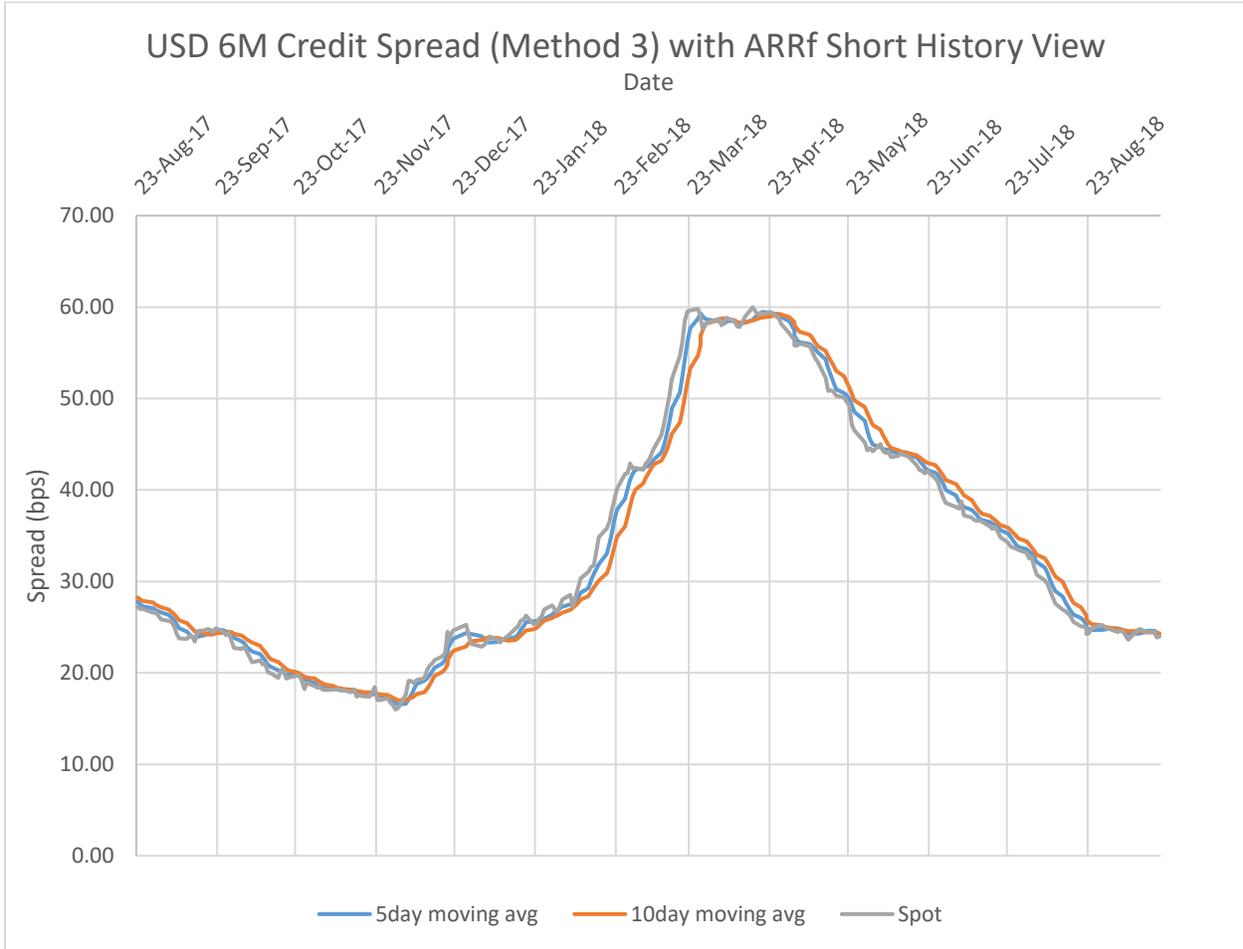
**Source: Bloomberg Finance L.P.**

**Graph 51**



**Source: Bloomberg Finance L.P.**

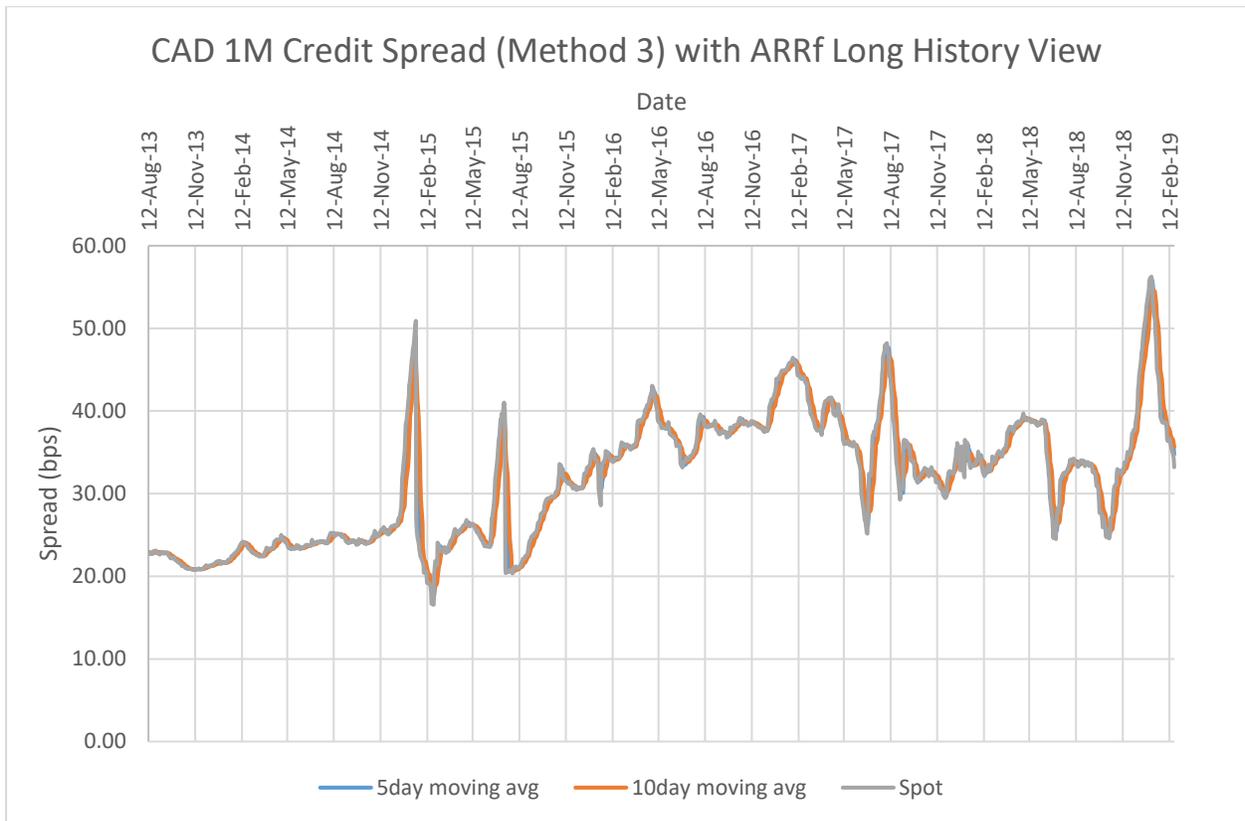
**Graph 52**



**Source: Bloomberg Finance L.P.**

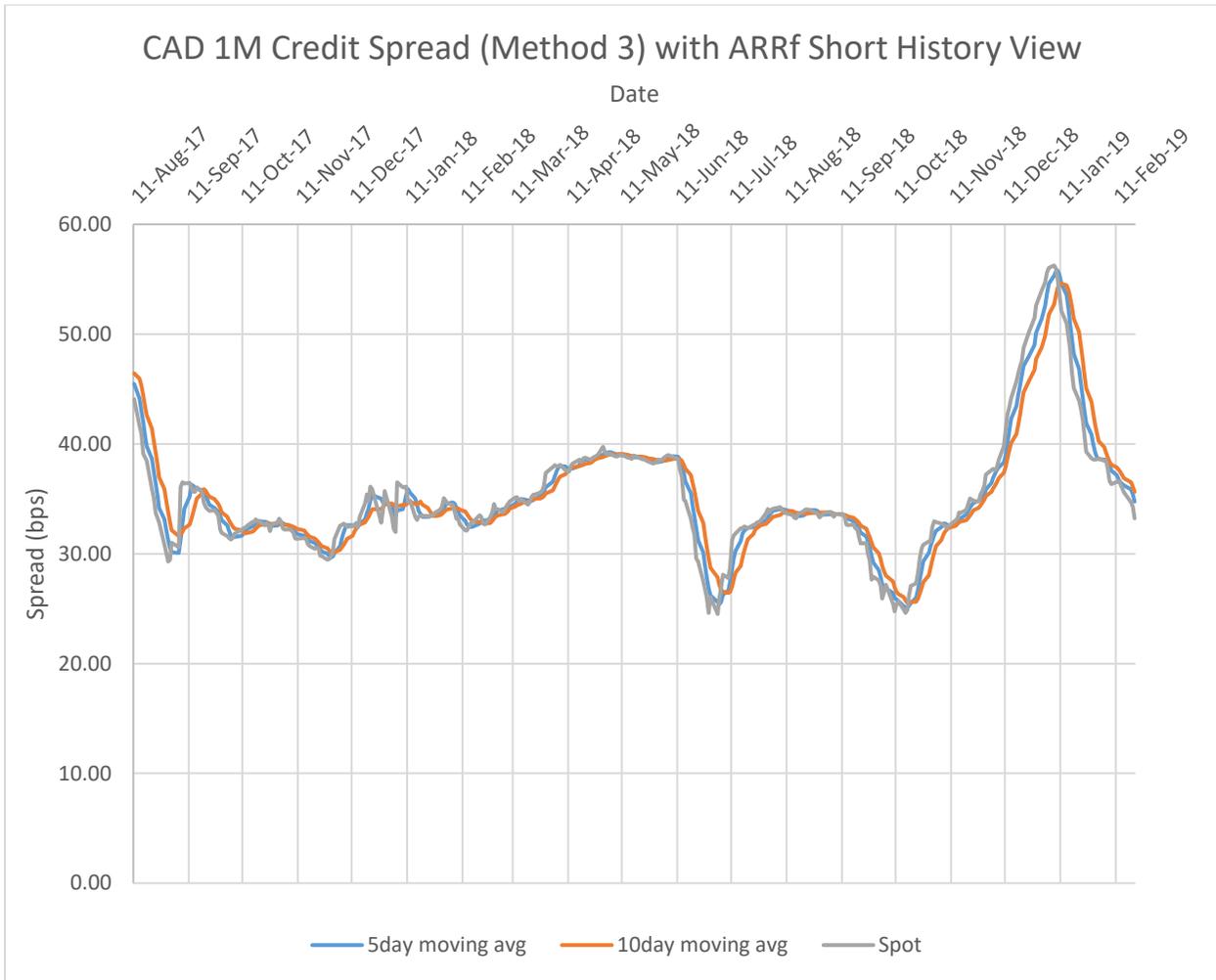
## CAD (CORRA)

Graph 53



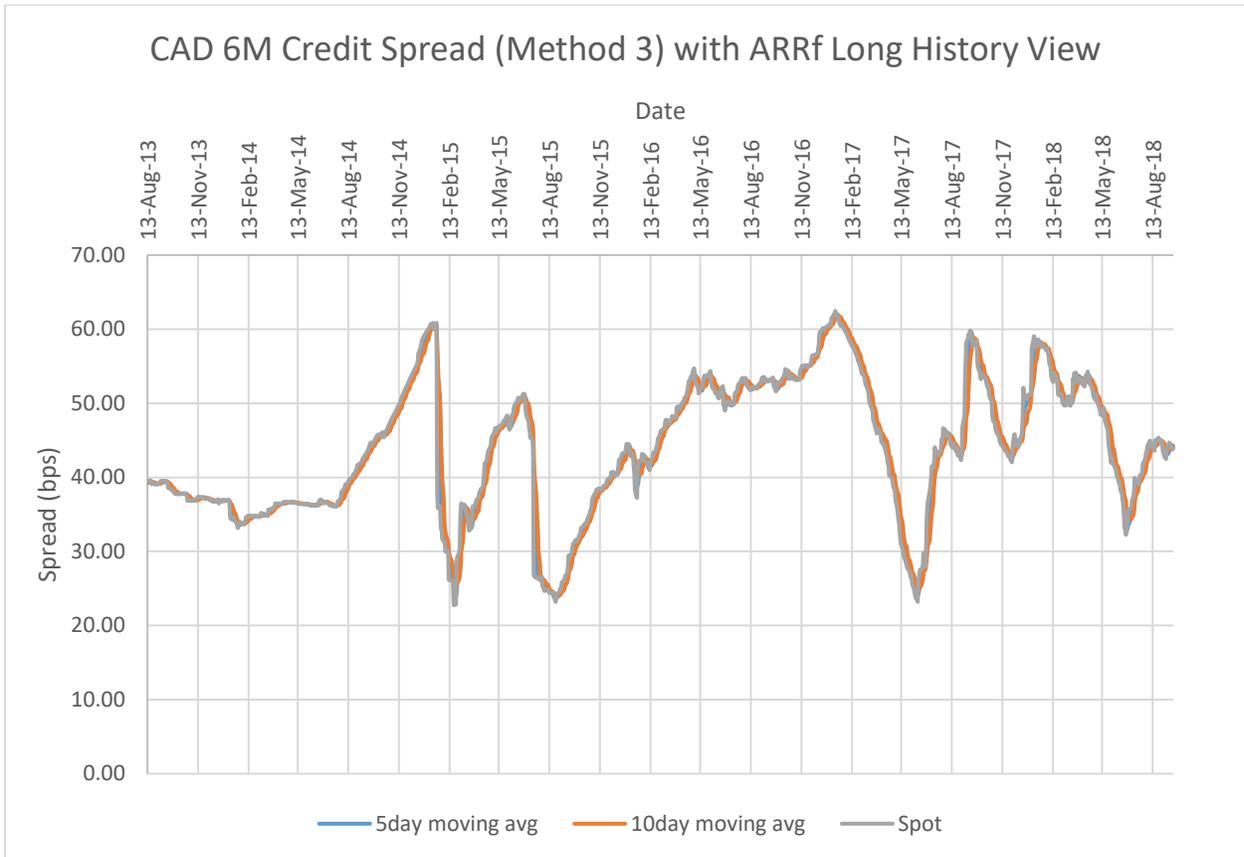
Source: Bloomberg Finance L.P.

**Graph 54**



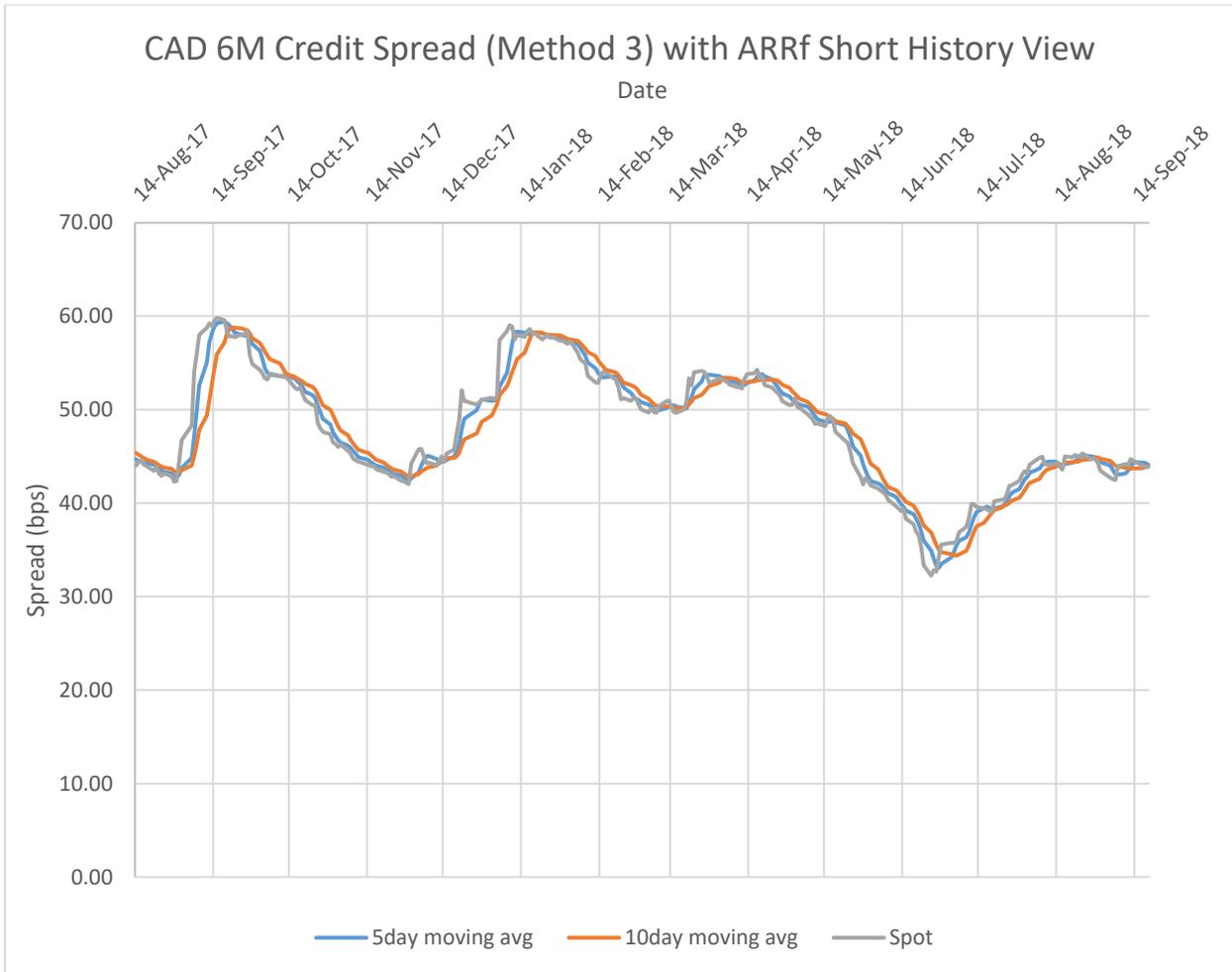
**Source: Bloomberg Finance L.P.**

**Graph 55**



**Source: Bloomberg Finance L.P.**

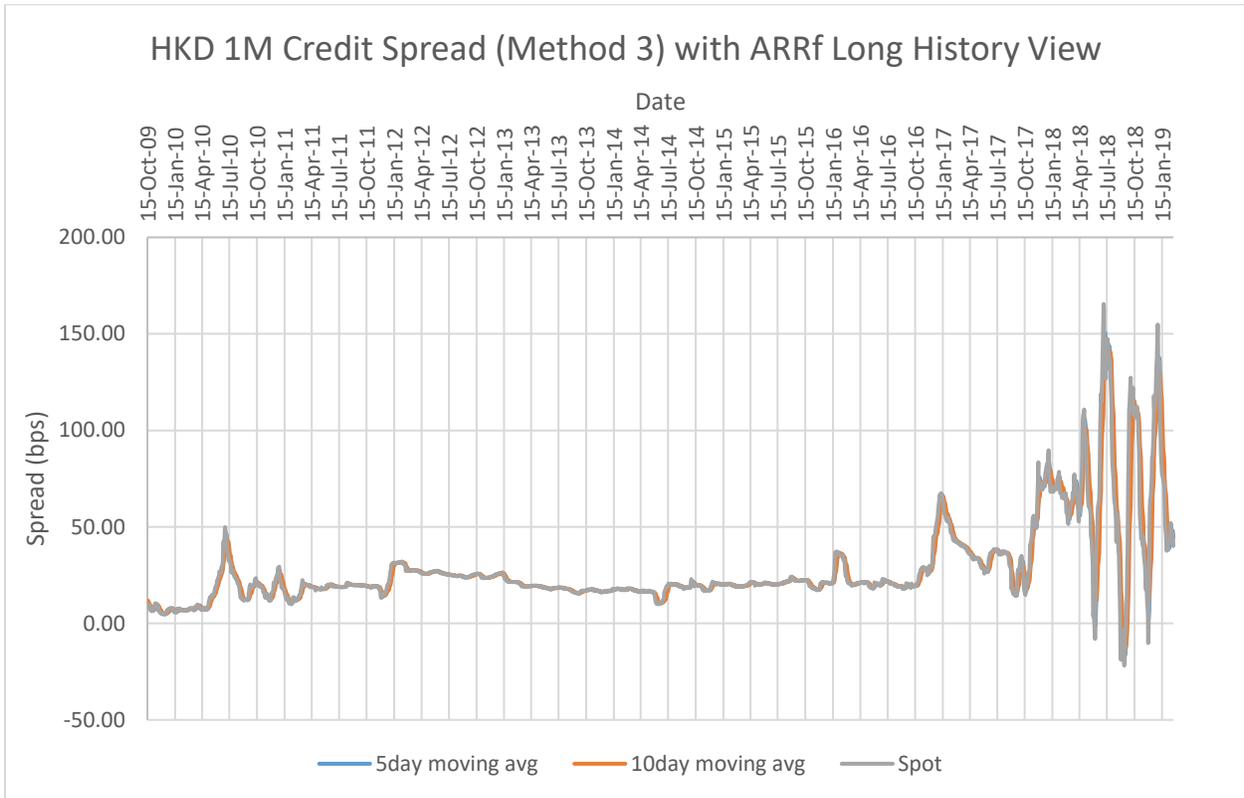
**Graph 56**



**Source: Bloomberg Finance L.P.**

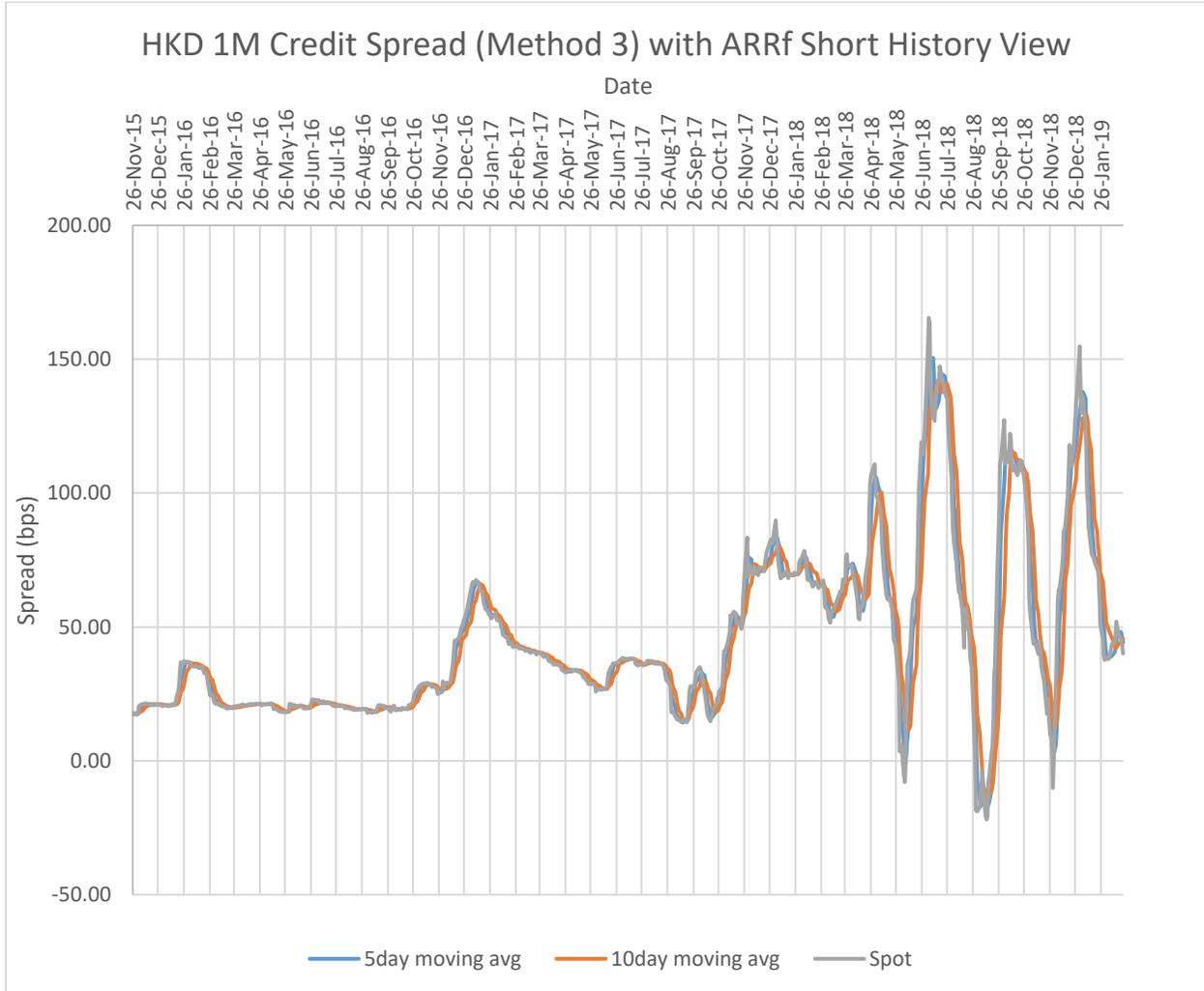
# HKD (HONIA)

## Graph 57



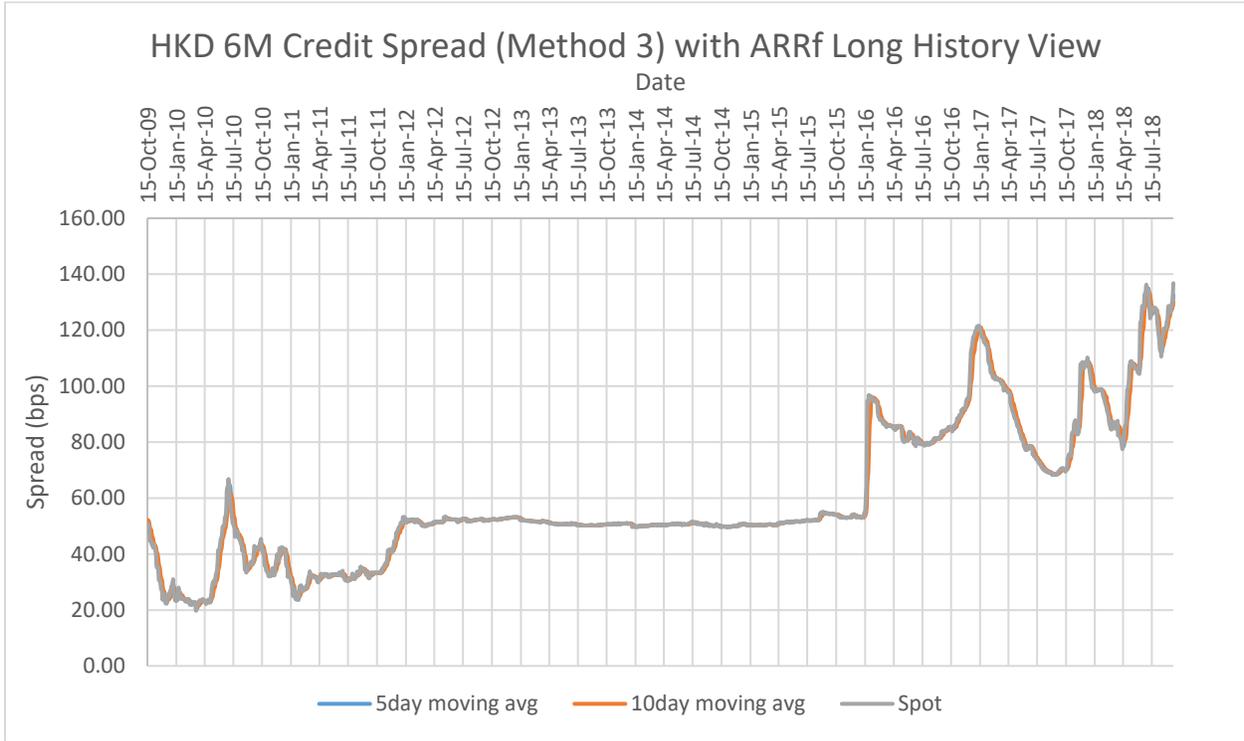
Source: Bloomberg Finance L.P.

**Graph 58**



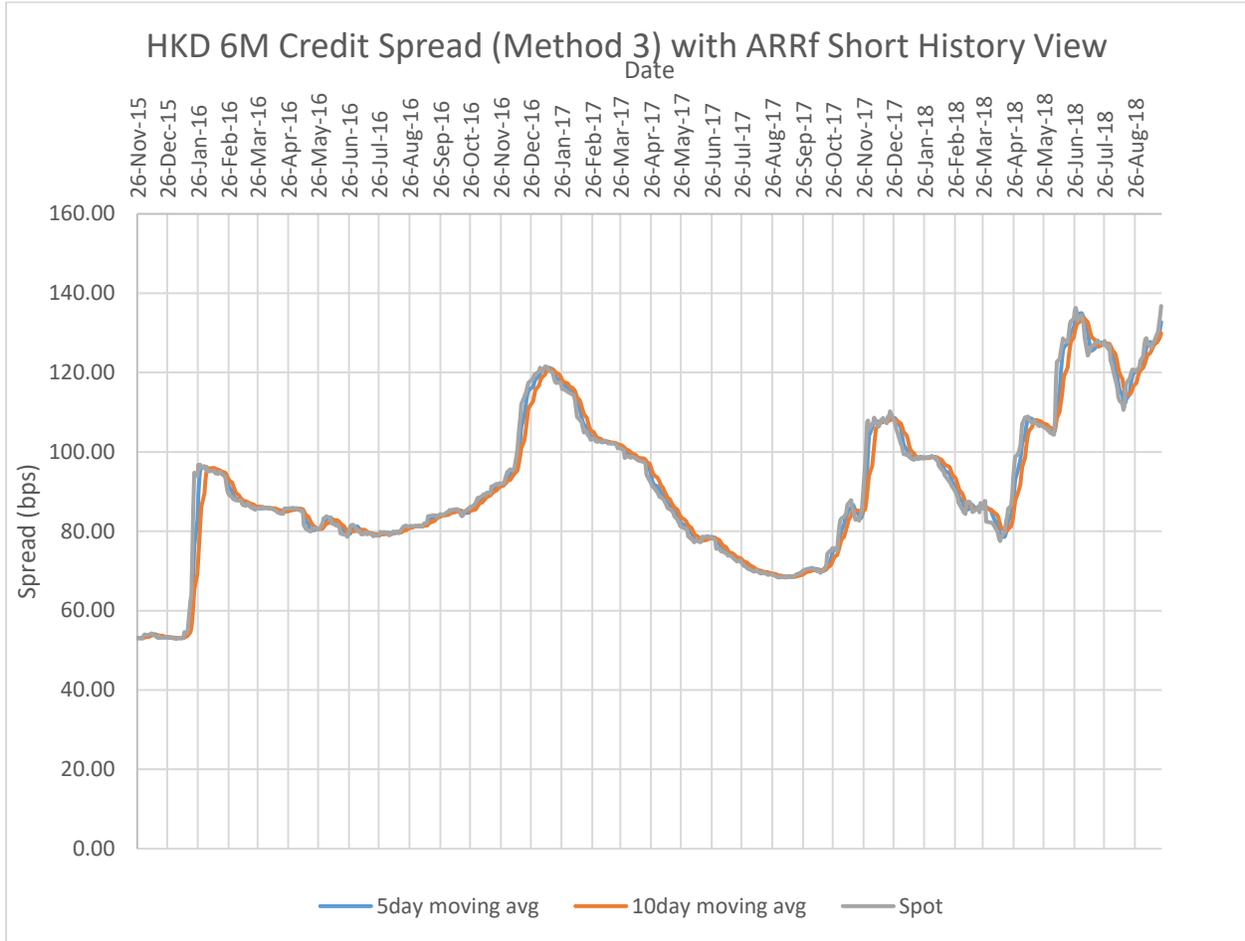
**Source: Bloomberg Finance L.P.**

**Graph 59**



**Source: Bloomberg Finance L.P.**

**Graph 60**



**Source: Bloomberg Finance L.P.**