ANALYSIS OF SOFR USING ADVANCED SQL TECHNIQUES

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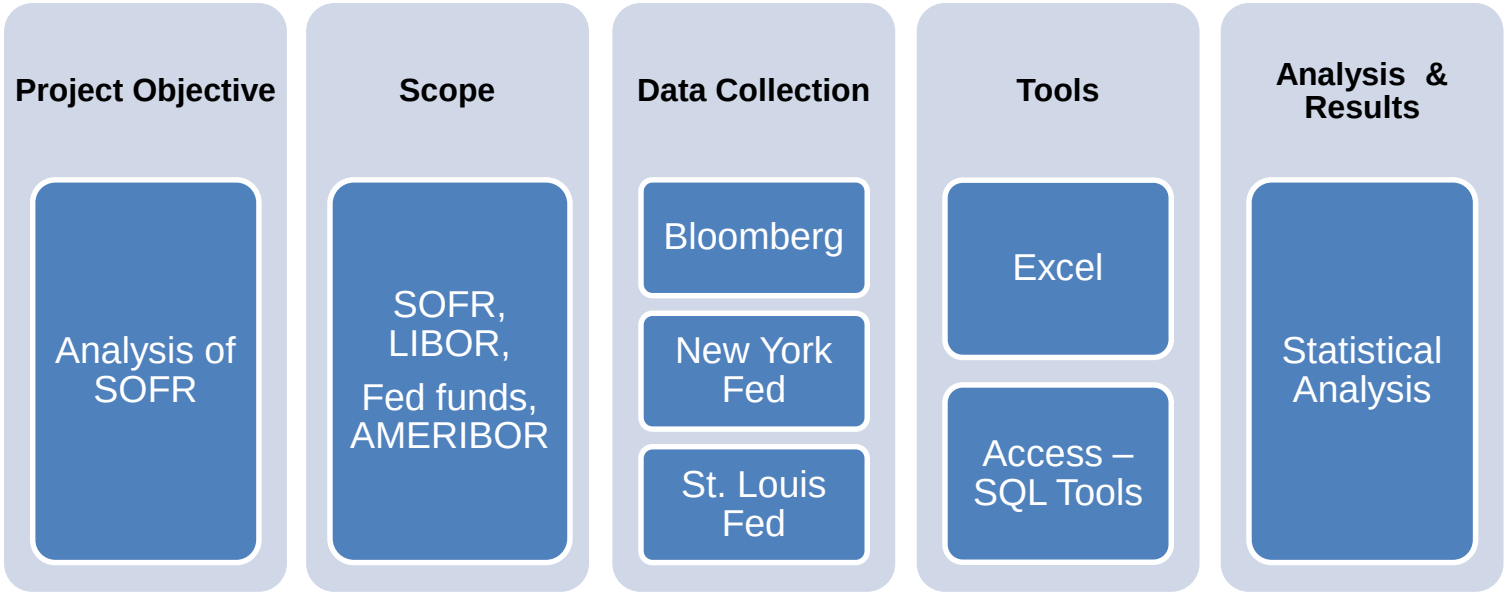
OBJECTIVE

- Detailed analysis of SOFR Vs. Other rates
- Utilize SQL commands

PROJECT METHODOLOGY



What is SOFR (Secured Overnight Financing Rate)

- SOFR is based on transactions in the Treasury repurchase market, where banks and investors borrow or loan Treasuries overnight.
- A group of large banks, the Alternative Reference Rate Committee (ARRC), selected the rate as an alternative to the London interbank offered rate (Libor) in derivatives.
- Depth and robustness of the market where around $800 billion is traded daily.

OTHER RATES

AMERIBOR

An index of overnight unsecured lending taking place across the CBOE platform AFX. It is mainly concerned with the interbank market between smaller, regional US banks.

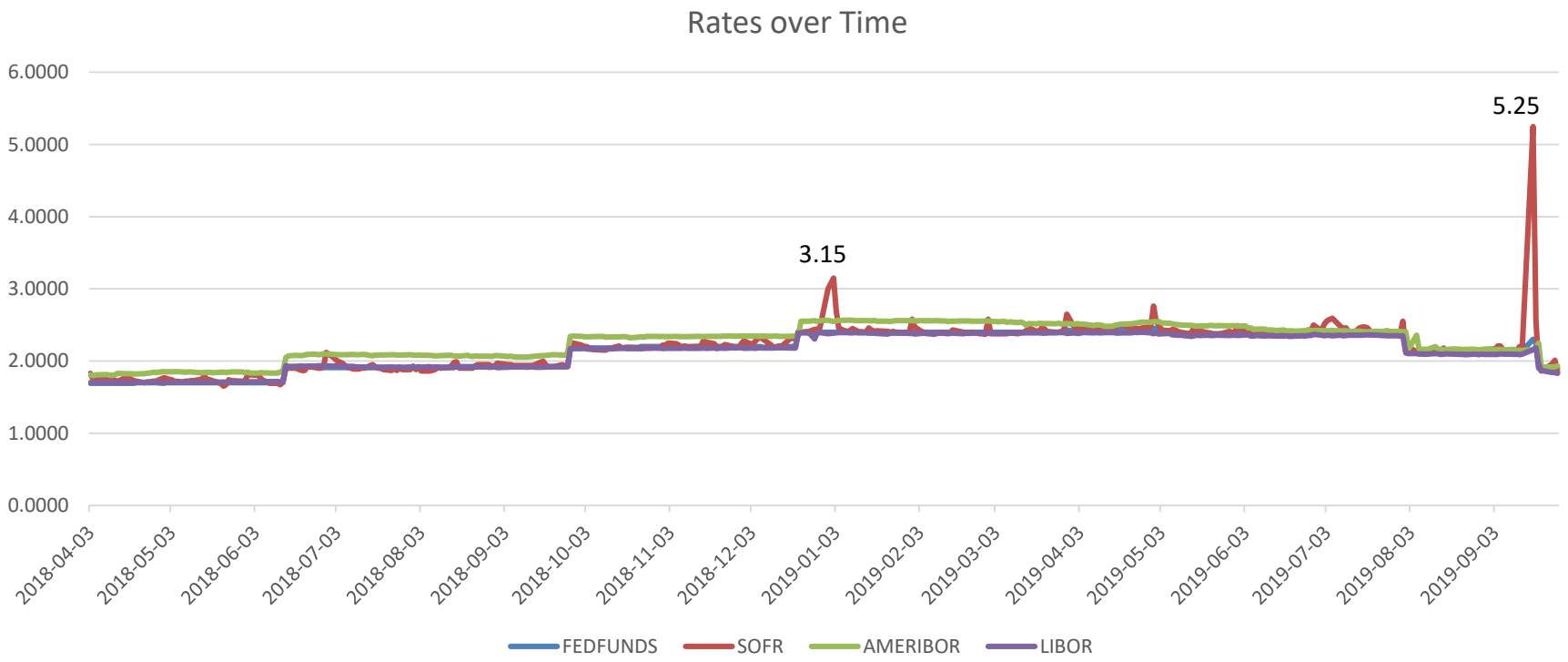
Fed Funds Rate

Interest rate that banks charge other banks for lending them money from their reserve balances on an overnight basis.

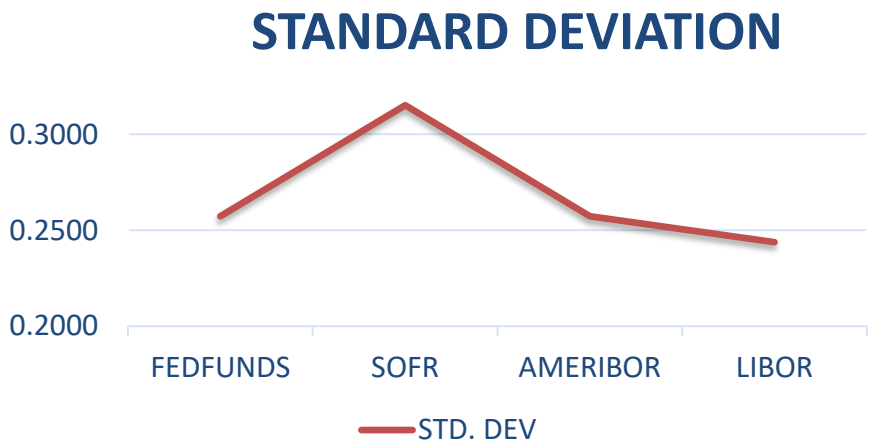
LIBOR

A benchmark interest rate at which major global banks lend to one another in the international interbank market for short-term loans.

RATES OVER TIME



SOFR – Most Volatile



SQL QUERY

```
SELECT DISTINCTROW AVG([SOFR].[SOFR]) AS [AVG OF SOFR],
ROUND(STDEV([SOFR].[SOFR]),4) AS [DEV OF SOFR],MIN([SOFR].[SOFR]) AS [MIN OF SOFR],
MAX([SOFR].[SOFR]) AS [MAX OF SOFR],
COUNT(*) AS [COUNT OF SOFR]

FROM SOFR;
```

SQL RESULT

SUMMARY				
AVG OF SOFR	DEV OF SOFR	MIN OF SOFR	MAX OF SOFR	COUNT OF SOFR
2.1818	0.3156	1.6500	5.2500	371

MERGE DATA

SQL RESULT

Ameribor | Fedfunds | MergedData | SOFR Query | MergedData Query

DATE	Ameribor	fedfunds	LIBOR	SOFR
9/26/2019	1.9288	1.9000	1.8299	1.8500
9/25/2019	1.9202	1.9000	1.8408	2.0100
9/24/2019	1.9184	1.9000	1.8420	1.9600
9/20/2019	1.9195	1.9000	1.8685	1.8600
9/19/2019	2.2469	1.9000	1.9621	1.9500
9/18/2019	2.1851	2.2500	2.1853	2.5500
9/17/2019	2.1573	2.3000	2.1549	5.2500
9/13/2019	2.1477	2.1400	2.0948	2.2000
9/13/2019	2.1477	2.1400	2.0948	2.2000
9/12/2019	2.1498	2.1300	2.0883	2.2000
9/12/2019	2.1498	2.1300	2.0883	2.2000
9/11/2019	2.1524	2.1300	2.0945	2.1500
9/11/2019	2.1524	2.1300	2.0945	2.1500

SQL QUERY

```
SELECT
a.DATE, a.Ameribor, f.fedfunds, l.LIBOR, s.SOFR
FROM  Ameribor AS a, fedfunds AS f,  LIBOR  AS l,
SOFR AS s
WHERE
a.DATE = l.DATE AND
a.DATE=s.DATE AND
a.DATE = f.DATE
AND
a.Ameribor IS NOT NULL AND
f.fedfunds IS NOT NULL AND
l.LIBOR IS NOT NULL AND
s.SOFR IS NOT NULL;
```

EXPLORATORY ANALYSIS

6

Number of Instances where
|SOFR - FEDFUNDS| >= 30 bps

SQL Query

```
SELECT COUNT(*)
FROM MergedData
WHERE ABS(SOFR-fedfunds) >=0.30
```

EXPLORATORY ANALYSIS

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Number of Instances where
|AMERIBOR - FEDFUNDS| >= 30 bps

SQL Query

```
SELECT COUNT(*)
FROM MergedData
WHERE ABS(AMERIBOR - fedfunds) >=0.30
```

EXPLORATORY ANALYSIS

6

Number of Instances where
|SOFR – LIBOR| >= 30 bps

SQL Query

```
SELECT COUNT(*)
FROM MergedData
WHERE ABS(LIBOR-SOFR) >=0.30
```

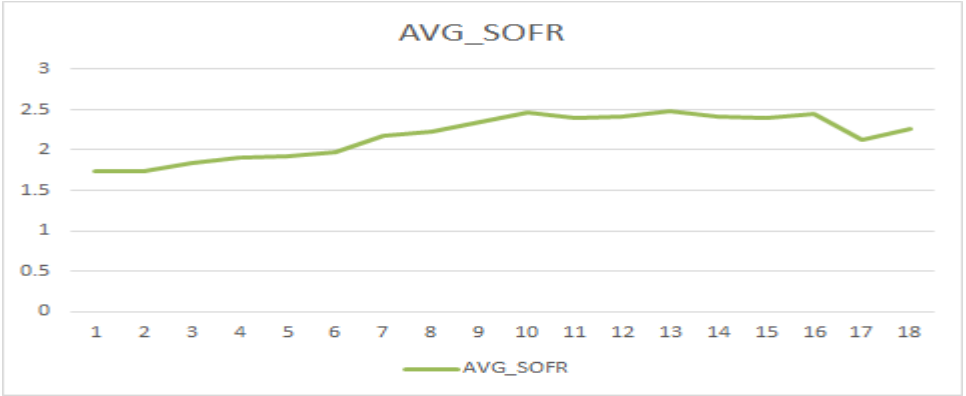
USE OF GROUP BY CLAUSE

RESULT

Year	MTH	AVG_SOFR
2018	4	1.742
2018	5	1.7305
2018	6	1.8367
2018	7	1.9138
2018	8	1.9174
2018	9	1.9684
2018	10	2.1841
2018	11	2.2205
2018	12	2.3505
2019	1	2.4724
2019	2	2.4042
2019	3	2.4171
2019	4	2.4762
2019	5	2.4205
2019	6	2.393
2019	7	2.4495
2019	8	2.1275
2019	9	2.2612

SQL QUERY

```
SELECT YEAR(DATE) AS Year, MONTH(DATE)
AS MTH, ROUND(AVG(SOFR),4) AS
AVG_SOFR
FROM MergedData
GROUP BY MONTH(DATE), YEAR (DATE)
```



USE OF CASE/ SWITCH STATEMENT

RESULT

SOFR	Particular
2.1200	Below Mean
2.1300	Below Mean
2.1400	Below Mean
2.1500	Below Mean
2.1600	Below Mean
2.1700	Below Mean
2.1800	Below Mean
2.1900	Above Mean
2.2000	Above Mean
2.2100	Above Mean
2.2200	Above Mean

SQL QUERY

```
SELECT SOFR,
SWITCH(SOFR >2.1818, "Above Mean",
SOFR<2.1818, "Below Mean")
AS Particular
FROM MergedData
GROUP BY SOFR;
```

NEAREST NEIGHBOUR

RESULT

- LIBOR appears to be closest to Fed Funds rate
- AMERIBOR appears to be farthest from Fed Funds rate

SOFR_Fedfunds	LIBOR_Fedfunds	AMERIBOR_Fedfunds
0.0352	0.0153	0.1158

SQL QUERY

```
SELECT ABS(ROUND(AVG(SOFR-Fedfunds),4)) AS SOFR_Fedfunds,
ABS(ROUND(AVG(LIBOR-Fedfunds),4)) AS LIBOR_Fedfunds,
ABS(ROUND(AVG(AMERIBOR-Fedfunds),4)) AS AMERIBOR_Fedfunds
FROM MergedData;
```

REFERENCES

- *https://www.clarusft.com › ameribor*
- https://www.investopedia.com/terms/f/federalfundsrate.asp
- https://www.investopedia.com/terms/l/libor.asp

THANK YOU