



U.S. Dollar ICE Bank Yield Index Update

July 2019



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Executive Summary

On January 24, 2019, ICE Benchmark Administration (IBA), a leading provider of global interest rate and other financial benchmarks, introduced a preliminary methodology in a [white paper](#) for a new interest rate index, the U.S. Dollar ICE Bank Yield Index. The fully transaction-based index is designed to measure the average yields at which investors are willing to invest U.S. dollar funds over one-month, three-month and six-month periods on a wholesale, senior, unsecured basis in large, internationally active banks. It has been developed to meet the potential benchmark needs of lenders, borrowers and other users of non-derivative (or “cash”) products that have typically sought term interest rate benchmarks linked to the average funding rates of a broad group of large banks.

IBA’s preliminary index methodology uses two types of wholly transactional input data representing wholesale, senior, unsecured bank investment yields: primary market funding transactions and secondary market bond transactions. These transactions are filtered by reference to specified eligibility criteria, then appropriately adjusted and weighted, before being used to generate a yield curve from which one-month, three-month and six-month term settings can be obtained.

Alongside the white paper, IBA published the results of a period of testing the preliminary U.S. Dollar ICE Bank Yield Index methodology during the course of 2018, and asked market participants and stakeholders for their feedback and suggestions.

IBA published an [update](#) to the white paper on April 10, 2019, to provide greater detail regarding the preliminary index methodology based on the initial feedback received, and to provide incremental testing results to the end of March, 2019. IBA also extended the comment period to May 31, 2019.

IBA is now publishing this second update for the following purposes:

1. To provide a summary of the feedback IBA has received on the U.S. Dollar ICE Bank Yield Index during the comment period.

IBA is pleased to have received a significant amount of direct feedback from market participants on the preliminary index methodology and from individual and group discussions, alongside analysis and comment from market commentators contained in research papers and other publications. The vast majority of this feedback and analysis has supported IBA’s efforts to build a credit-sensitive term benchmark in U.S. dollars with the potential to be used as a reference rate in lending commitments. Some market commentators have expressed the view that these efforts are unnecessary, as they believe the new overnight risk-free rate for U.S. dollars, the Secured Overnight Financing Rate (SOFR), could be adopted as a suitable interest rate benchmark for U.S. dollar lending commitments.

The feedback in relation to the proposed construction of the index has generally focused on the following key points:

- the eligibility criteria for the identification of transactions used in determination of the index;
- the curve-fitting methodology which generates the daily yield curve from which the term settings are obtained; and
- contingencies in case that insufficient transactions are available to generate one-month, three-month and six-month settings using the index methodology.

2. To present a potential update to the methodology whereby the U.S. Dollar ICE Bank Yield Index is determined by combining a term SOFR yield curve and a bank credit-spread curve based upon transactional data.

Some feedback has supported determining the index as the combination of a credit-spread curve, derived from bank funding and secondary market bond transaction data, and an implied term SOFR yield curve. This would allow the index’s construction to be anchored in daily implied term risk-free SOFR rates and supplemented by a credit-spread curve representing, on average, the prevailing credit-risk premiums associated with the wholesale, senior, unsecured debt obligations of large, internationally active banks. By constructing the credit-spread curve using transaction data observed over a multiple-day period (e.g. over a rolling five-day window)



the quantity and diversity of credit-sensitive inputs utilized in the index's calculation would be greater, potentially providing a more robust basis for the index.

3. To provide updated testing results of the preliminary methodology for the U.S. Dollar ICE Bank Yield Index during the period from January 2018 to the end of June 2019.

The updated test results for the period ending June 2019 are set out in the *Testing Results to end of June 2019* section of this update and are also available on [IBA's website](#). The index continues to exhibit a close correlation to widely-used wholesale, senior, unsecured U.S. dollar interest rate benchmarks.

Next Steps

IBA now intends to take account of the feedback received and continue to test and develop the U.S. Dollar ICE Bank Yield Index and its methodology. This will include:

- working with large, internationally active banks to seek commitments to provide funding transaction data to enable the index to be constructed reliably on an on-going basis;
- conducting further outreach to corporate borrowers to obtain their comments and feedback on the index; and
- engaging with stakeholders to obtain feedback on the proposal to construct the index as a supplement to term SOFR, i.e. as a combination of a transaction-based credit-spread curve and a term SOFR curve that is able to generate implied term SOFR rates on a sustainable and representative basis.

IBA will keep market participants informed of its progress through further updates over the course of the coming quarters.

As an authorized administrator under the EU Benchmarks Regulation (BMR), and provided that the outcome of testing is satisfactory, IBA will administer the U.S. Dollar ICE Bank Yield Index in compliance with the BMR and other relevant regulations.

There is no guarantee that IBA will continue to test the U.S. Dollar ICE Bank Yield Index, be able to source data to derive the index or publish the index in the future. Users of LIBOR should not rely on the potential publication of the U.S. Dollar ICE Bank Yield Index when developing and executing transition or fallback plans.



Feedback on U.S. Dollar ICE Bank Yield Index to date

Feedback responses

To date, IBA has received 15 direct feedback responses from banks and industry groups on the U.S. Dollar ICE Bank Yield Index (the “Index”) and the questions in the white paper and the first update soliciting feedback and suggestions. Additionally, a number of financial institutions and associations have referred to or commented on the U.S. Dollar ICE Bank Yield Index in research reports and other publications¹. IBA has also obtained feedback from market participants via group and individual meetings and discussions.

The vast majority of feedback and analysis has been supportive of the Index and of IBA’s efforts to build a transaction-based, credit-sensitive term benchmark in U.S. dollars with the potential to meet the needs of lenders, borrowers and other users of non-derivative (or “cash”) products.

Summary of the general feedback received on the Index

General supportive feedback on the Index has included:

- recognition that the development of a new forward-looking credit-sensitive interest rate benchmark could aid benchmark transition;
- comment highlighting the need for a multi-rate approach to aid the transition of cash products away from U.S. dollar LIBOR;
- acknowledgement that LIBOR has many attractive attributes as a lending benchmark which any new rate, such as the U.S. Dollar Bank Yield Index, should look to include to the extent possible;
- noting the importance of developing a rate which is easy for end-users to understand;
- comment that the Index methodology appears to be more transparent than LIBOR which, together with its transaction only-based methodology, could enable users to better understand day-on-day moves and trends;
- comment that producing an index without any element of expert judgement in the methodology increases its robustness and credibility; and
- comment that the Index could potentially serve as replacement for U.S. dollar LIBOR in loans and other cash products.

General feedback on the Index that has raised questions and concerns has included:

- the potential for a new benchmark, such as the Index, to distract from and potentially slow the overall transition to SOFR;
- questions as to the potential for the Index to be compliant with the IOSCO Principles for Financial Benchmarks² (the “IOSCO Principles”);
- comment that, even with the inclusion of bond transaction data from the Financial Industry Regulatory Authority’sTM (FINRATM) Trade Reporting and Compliance EngineTM (TRACETM)³, unsecured term bank funding activity in the money markets has reduced significantly and has considerably lower volumes than the volumes represented by outstanding financial products referencing U.S. dollar LIBOR;
- questions as to the ability to use the Index for fair-value hedge accounting; and
- concern over the provision of funding transaction data by banks beyond year-end 2021.

¹ For example, see: Andreas Schrimpf and Vladyslav Sushko, *Beyond LIBOR: a primer on the new reference rates*, Bank for International Settlements (BIS) Quarterly Review, March 2019, https://www.bis.org/publ/qtrpdf/r_qt1903e.htm.

² The International Organization of Securities Commission’s ‘Principles for Financial Benchmarks: Final Report’, <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD415.pdf>.

³ Financial Industry Regulatory Authority, FINRA, Trade Reporting and Compliance Engine, and TRACE are trademarks of Financial Industry Regulatory Authority, Inc. (FINRA), in the US and/or other countries. All rights reserved. See <http://www.finra.org/industry/trace> for further details regarding TRACE. The U.S. Dollar ICE Bank Yield Index is not associated with, or endorsed or sponsored by, FINRA.



Summary of responses to the specific feedback questions in the white paper and the first update

1. Do you agree that the U.S. Dollar ICE Bank Yield Index will be representative of the average yields at which investors are willing to invest U.S. dollar funds on a senior, unsecured basis in large internationally active banks operating in the wholesale U.S. dollar markets?

- The vast majority of responses agreed that the Index would be representative of the average yields at which investors are willing to invest U.S. dollar funds on a senior, unsecured basis in large internationally active banks operating in the wholesale U.S. dollar markets.
 - Many responses noted the importance of having sufficient input data to produce the Index reliably on an ongoing basis, and suggested that IBA should look to increase the amount of input data where possible.
 - Some concerns were raised about the potential volatility of the published rate during periods of illiquidity, such as that seen over year-end December 2018.
- Some responses considered that constructing the Index explicitly as a combination of term SOFR and a credit-spread would be more transparent, possibly aiding the desired wider market transition to SOFR.
- One response included concerns that the current preliminary methodology might not represent an average bank's credit risk, because the weighting of the transactional input data used in respect of each bank is not constant across days; and recommended instead calculating separate credit spreads for each bank and then averaging these.

2. Do you agree that the U.S. Dollar ICE Bank Yield Index should be published for one-month, three-month and six-month tenors, or should other tenors be included? Is a shorter tenor required for stub calculations, or could a different overnight rate be used for this purpose?

- There was widespread agreement amongst respondents that one-month, three-month and six-month would be the most widely-used tenors.
- There were also sub-sets of responses requesting that a shorter tenor be published (e.g. one-week) to allow for stub calculations, and that there should also be a 12-month tenor.

3. Curve fitting methodology

a. Do you agree with the curve-fitting methodology described in the U.S. Dollar ICE Bank Yield Index [white paper](#) (i.e. a least squares best fit of all eligible data points to a third order polynomial), or would a different curve-fitting model (such as a spline-based approach) be more appropriate?

- The majority of responses were supportive of a least squares best fit of all eligible data points to a third order polynomial.
- Support for constructing the Index as a credit-spread curve supplement to term SOFR.
- A sub-set of responses either did not answer this question or expressed no preference, with one noting that the curve should be selected to exhibit the least volatility.
- One response did not consider curve-fitting to be an appropriate element of the methodology. This was because transaction data in the 12-month maturity range (for example) should not contribute to the published rate in the one-month term setting.

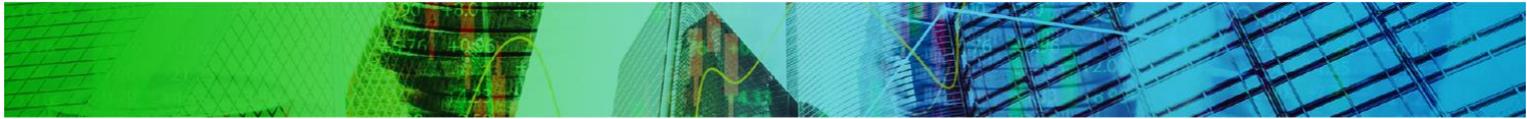
b. Should IBA seek to address or exclude outlier transaction yields when constructing the yield curve, either through the use of a robust regression model or by imposing a +/- 100bps (or other size) sensitivity test relative to the calculated curve?

- There was strong support for the exclusion of outliers. Responses included a basic acknowledgment that an outlier process should be in place, an outright agreement with a +/- 100bp threshold or some other spread threshold to be determined by IBA, a requirement for quantitative work to assess the appropriate spread, and one preference for a robust regression curve.
- Some responses queried how IBA would assess eligible transactions (as opposed to outliers) for representativeness, and suggested that quantitative work would be required to assess the appropriate threshold spread and that any rule-based data screening should be supplemented with governance and analytics, including periodic re-evaluation for appropriateness.
- There were also questions regarding how outliers would be managed in periods of stress.
- There was a suggestion that any outlier exclusion process might constitute expert judgement.
- Another response proposed that all transactions should be retained for use in the calculation in order to support the credit component of the Index, noting that outlier exclusion algorithms could potentially hide signs of market stress.



- c. Should IBA seek to construct a separate credit curve from the input data points and add this back to a notional “risk-free” rate curve to generate a composite curve for the index?**
- One respondent had concerns about using such a methodology in the event that there was no eligible transaction data available to build the credit curve, as then the Index would be driven only by the risk-free rate curve and would not reflect credit quality (particularly in times of stress).
 - Another respondent considered that this methodology could provide a more robust and representative credit component if transactions executed during a longer input data window were incorporated so as to anchor the Index in more credit-sensitive information.
- 4. Do you agree with a target of ten (10) transactions per maturity range, or should this target be increased for some/all maturity ranges? When responding to this question please consider the curve-fitting methodology, which incorporates all eligible data points across the curve on any given day to construct a “best fit” yield curve. Note also that if the requirement for multiple funding transactions with multiple counterparties is removed from the methodology, then the total number of eligible transactions for each calculation day might be expected to increase.**
- Responses to this question were split between those that considered 10 transactions to be sufficient and others that thought this minimum value should be increased.
 - Some respondents highlighted that the most important consideration was to have a fully transaction-based methodology that catered for scenarios where the minimum target could not be achieved.
 - Some feedback included concerns that the USD 2 million minimum threshold for secondary market bond transactions was too small, and highlighted the need to address potential concentration risk.
 - There was some support for relaxing the requirement to use multiple funding transactions from multiple counterparties in order to increase the number of eligible funding transactions.
- 5. a. Do you agree with using eligible transactions from input windows for up to five (5) previous calculation days where the target number of transactions for a particular maturity range is not achieved using only the input window for the current calculation day?**
- b. Would it be more appropriate to use transactions from a greater/smaller number of previous days’ input windows for any or all of the maturity ranges where the target is not achieved using the current day’s window?**
- c. Would it be more appropriate to use transactions from previous days’ input windows irrespective of whether the target is reached using the current day’s window?**
- Many responses agreed that a five-day look-back period was reasonable.
 - There were also suggestions to use a longer look-back period, to use consistent look-back periods at all times, and to conduct further analysis to determine the appropriate input data window.
 - One respondent suggested eligibility windows similar to those used in EURIBOR’s hybrid methodology⁴ (i.e. 1w +/- 2 d, 1m +/- 1w, 3m +/- 2w, 6m +/- 3w, 12m +/- 3w).
 - One respondent noted that if IBA was to build the Index from separate term SOFR and credit-spread curves, then the credit-spread curve construction would potentially benefit from a longer look-back in times of stress.
 - There was some feedback suggesting that previous days’ transactions should not be used if sufficient same-day transactions were available, as satisfying the perceived need for more transactions could widen the input data window unnecessarily and potentially result in the Index being unrepresentative (for example, in times of stress).

⁴ See Section 7.1.3 of https://www.emmi-benchmarks.eu/assets/files/D0373B-2018%20Second%20Consultation%20Hybrid%20Euribor_full.pdf



- 6. Do you agree that primary market funding transactions should be assigned an initial weighting of 100 percent and that secondary market bond transactions should be assigned an initial weighting of 50 percent, because funding transactions tend to be of a larger size than secondary market transactions in bank bonds? Would an alternative weighting (e.g. a greater range of weightings of the types of input data used in the construction of the Index to better reflect variations in volumes seen in respect of the different types of input data) or no weighting be more appropriate?**
- A majority of respondents thought the proposed weightings were appropriate when combined with the ability to modify these going forward (but only infrequently, and with consultation) as the market evolves.
 - Some respondents considered that secondary market bond transactions were likely to reflect greater credit volatility in a stressed market, and could also reflect other time-dependent idiosyncratic factors of issuing banks such as individual balance sheet pressures over particular reporting periods.
 - There was a request for further explanation as to how the weightings were determined and a suggestion that further testing could be published with and without the weightings being applied.
 - There was a suggestion that weightings should be assigned to individual banks and that the banks' weightings should be kept constant over time.
 - One respondent suggested that weightings could be chosen so as to most closely approximate the past behavior of U.S. dollar LIBOR.
- 7. Do you agree that transactions from input windows for previous calculation days should be given a lower weighting than transactions from the current day's input window? Do you have any comments on the weightings suggested?**
- There was general support for the weightings for transactions from previous days to be lower than for transactions from the current day's input data window. Other responses noted that the correct weighting was hard to quantify and may need consideration and debate, and that the weightings should not be adjusted without careful consideration.
 - One respondent suggested that transactions from more than five days before the current calculation day should not have a weighting of greater than 50%.
 - One respondent considered that a time-related weighting was not required in light of the market data adjustment to previous days' transactions.
 - There was one preference for assigned weights for each bank to be applied consistently to various inputs.
- 8. Where transactions from input windows for previous calculation days are allocated to a maturity range, is an OIS-based adjustment sufficient or should other factors be taken into consideration?**
- Many responses were supportive of a market data-based adjustment being applied to previous days' transactions (or the Index itself, if there was need to apply a contingency) to reflect any changes in market rate expectations.
 - One respondent thought the use of OIS was reasonable if the OIS market was sufficiently liquid.
 - A sub-set of responses noted that an additional credit-spread adjustment would be desirable because OIS would only adjust for (risk-free) interest rate expectations, and that this could be an issue during a period of stress.
 - Some respondents raised concerns regarding how to manage adjustments over quarter- or year-ends, with one respondent questioning whether adjustments were required to specifically address the turn effect.
 - There were also suggestions to consider whether there is a need for any liquidity spread adjustment.
 - Some respondents sought greater clarity on the source and timing of the OIS data that IBA proposed to use and the timing of when that would be gathered. Others suggested that the OIS source should be compliant with the IOSCO Principles and that the US Treasury Bill rate could also be considered for the purposes of market-based adjustments.



9. **Do you agree that no single bond issuer should be able to represent more than ten (10) percent of the number of bond transactions used to construct the U.S. Dollar ICE Bank Yield Index for any given calculation day?**
- 10% was thought to be a reasonable maximum threshold weighting by a majority of respondents. There was strong consensus that the Index should not be unreasonably skewed due to the credit conditions of a single issuer.
 - One respondent queried how the transactions would be adjusted when bonds from one issuer represented more than 10% of the number of bond transactions, and suggested aggregating multiple transactions from the same issuance to calculate a weighted average.
 - It was proposed to have a similar threshold for primary funding transactions.
 - One respondent suggested that the maximum weighting should be increased in preference to looking back further in time to use previous days' transactions, potentially in a waterfall in order for the published rate to be reflective of the prevailing market funding levels.
10. **Should IBA include transactions for bank holding companies in any circumstances (e.g. one which has consistent pricing levels with the operating company level issuance)? For example, should the methodology include the holding company debt of Goldman Sachs Group Inc. and Morgan Stanley or The Bank of New York Mellon Corporation, given their business profiles and the minimal amount of bond issuance at the bank operating company level for each of these institutions? What criteria might distinguish the eligibility of bank holding company obligations from operating company obligations (e.g. different business/credit profile or different pricing)?**
- Many respondents did not express a view on this question.
 - A number of respondents considered that financial or bank holding companies should be included and made various suggestions as to how to treat these (e.g. capping inclusion at some percentage of overall issuance volumes, or comparing the credit rating of the holding company to that of the operating company at each bank to assess eligibility, together with other relevant criteria to assess the inclusion of holding company issuers).
 - Other respondents considered that bank holding companies had fundamentally different business models from other banking entities, noting that these and other differentials could affect funding levels, balance sheets, risk appetite, sources of income and other factors related to debt pricing.
11. **Please provide feedback on any of the eligibility criteria for:**
- a. **Primary market funding transactions (i.e. transaction type, counterparty type, funding location, transaction size, minimum number of transactions, minimum number of counterparties). Should the requirement for multiple funding transactions with multiple counterparties be removed from the criteria and, if so, should the minimum transaction size for individual transactions be varied?**
- A majority of responses either expressed no opinion or supported using the current primary market funding transaction eligibility criteria, with specific support for using the current LIBOR "waterfall" methodology criteria.
 - Other respondents recommended relaxing the current requirements, such as transaction size and product type, so as to include all transactions that represented the cost of funding at the relevant capital level of the identified institutions.
 - There were suggestions both to increase and also decrease the minimum transaction size.
 - The inclusion of data for floating rate transactions was also recommended by one respondent.
- b. **Secondary market bond transactions (i.e. bond type (coupon type and call eligibility), coupon range, bond issuance size, transaction size, days to maturity of bond). Should floating rate bonds be considered for inclusion in the Index? Please also provide feedback on the process for varying any eligibility criteria in the future to reflect developments in the market. This would be subject to an appropriate consultation process.**
- A number of respondents expressed no opinion on this question.
 - Many responses were supportive of a coupon range requirement, with some recommending analysis to determine the correct range. Other respondents suggested including all coupons.

- One respondent recommended the inclusion of corporate deposits and certificate of deposits within the secondary market bond data.⁵
- Another respondent suggested that secondary market bond transactions in floating rate notes should be included, with the floating rate being appropriately converted to a prevailing fixed rate. It was noted that any potential future floating rate note issuances referencing the U.S. Dollar ICE Bank Yield Index would not be eligible for inclusion.
- There were suggestions both to increase and decrease the minimum transaction size. These included both a concern that USD 2 million was too high and excluded too many transactions and a recommendation to increase the minimum transaction size to USD 5 million.
- One respondent's preference was for all secondary market bond transactions to be included, except for convertible bonds.
- Concerns were also noted over the potential for regulatory change to impact the eligibility criteria (e.g. if this were to result in an increase in the prevalence of call features).

12. Please provide any comments on IBA's contingency proposals regarding how the Index would be published in the event that insufficient transaction data points are available to produce the yield curve and generate the one-month, three-month and six-month settings on a given day.

- Respondents noted that a contingency policy was important to ensure a rate would be able to be published every day.
- Some respondents had concerns around publications that did not utilize actual transactions and any potential resulting volatility
- One respondent questioned how a contingency policy could be effectively managed in periods of stress to ensure any move in the credit risk premium was reflected in the published rate.
- There was also a recommendation that IBA develop a contingency plan for the event that the number of banks providing primary market funding transaction data decreases.

13. Should IBA use evaluated prices and associated yields for bonds that otherwise satisfy the input data eligibility criteria for the Index but in respect of which there are no secondary market transactions that are eligible for the purposes of constructing the yield curve for a particular calculation day? The purpose of incorporating evaluated prices would be to expand the input data set that is used to calculate the Index on any given day (note that evaluated prices are widely used in the calculation of fixed income benchmarks incorporating corporate bonds given the liquidity characteristics of the corporate bond market).

- A number of respondents considered that IBA could include evaluated prices for bonds as eligible input data, and that this could offer a practical market solution in the absence of secondary market transactions.
- Some concerns were raised that these prices would not be based on transactional data and, as a result, might not comply with the IOSCO Principles, which would need to be explored further.
- There was a recommendation for certain minimum eligibility criteria to apply to evaluated price data and for this to be sourced via regulated electronic platforms only.

14. Should any other sources of/types of data be considered for inclusion in the Index?

- There was a suggestion that IBA consider including primary issuance data sourced from DTCC.
- As noted above, respondents also recommended that IBA seek to include floating rate primary market funding and secondary market bond transaction data (appropriately converted into a fixed rate).

15. Do you agree with publishing the U.S. Dollar ICE Bank Yield Index daily in the morning New York time on the day following the day in respect of which the yield curve is calculated?

- Many respondents approved of this proposal, particularly if the Index were to be administered in the United States.
- One response suggested retaining as many similarities as possible with LIBOR's publication times in order to minimize operational issues.
- One respondent expressed a preference for an 8:00 am New York time publication.

⁵ Corporate deposits are included in the U.S. Dollar ICE Bank Yield Index from funding transactions if they meet the overall eligibility criteria and are of a duration of 35 days and over. Fixed rate certificates of deposit are also part of the eligible transactions included from the LIBOR "waterfall" methodology.

- Clarity was requested as to timing of calculation and publication.

16. Should the administration and calculation of the U.S. Dollar ICE Bank Yield Index be undertaken in the United Kingdom, in the United States or in another jurisdiction?

- Most respondents did not express any preference.
- One respondent noted that the EU Benchmarks Regulation and the current uncertainty around Brexit could impact the preferred jurisdiction.

17. Please provide any other feedback you have on the U.S. Dollar ICE Bank Yield Index or its methodology.

In response to this question, market participants provided feedback including:

- A suggestion to explore publishing the Index as a rolling average to minimize day-on-day volatility.
- Receptiveness to the creation of an index to aid transition particularly for those with asset and liability management needs.
- A comment noting the importance of data sufficiency and the management of removing outliers, including how any threshold would be assessed or adjusted.
- Questions as to the potential to use the Index as part of the U.S. dollar LIBOR calculation or as a fallback for U.S. dollar LIBOR.
- Questions as to whether an equivalent bank yield index could be developed for other currencies.
- A query as to how IBA intends to manage cancelled and corrected TRACE™ transactions.
- A comment that the methodology was too complex.
- A suggestion that IBA should look to also include primary issuances sourced from DTCC.
- A suggestion that communications to users regarding the Index should highlight the differences from U.S. dollar LIBOR.
- A request that consideration be given to the calculation of the Index over holidays.
- Encouragement to continue to look to increase inputs and relevant markets to make the Index more robust.
- A recommendation that IBA develop a contingency plan if the number of banks providing primary market funding data decreases.
- A proposal that a framework to maintain the stability of the Index should be developed in line with the IOSCO Principles.
- One respondent noted the importance of users' developing appropriate fallback clauses where the Index is used in contracts.
- Another recommended that IBA undertake outreach with borrowers and corporates (not just large banks) to promote the Index.

18. Please provide any feedback you have on IBA's proposed timeline and next steps for the launch of the U.S. Dollar ICE Bank Yield Index.

- Many respondents considered the timeline to be reasonable.
- There was a suggestion to publish the Index as soon as possible to provide a longer data analysis period, but also that the operational readiness of users should be considered.
- There was a request for continued regular testing updates, in particular so that stakeholders can see how the Index behaves over seasonal market events.
- There were also requests for the Index to be back-tested for the period of the financial crisis.
- One respondent considered that introducing the Index by Q1 2020 would be very challenging due to its potential dependence on term market data rates that are compliant with the IOSCO Principles.



Constructing the U.S. Dollar ICE Bank Yield Index as a Supplement to SOFR

The U.S. Dollar ICE Bank Yield Index, as described in the [white paper](#) and the [first update](#), is designed to measure the average yields at which investors are willing to invest U.S. dollar funds over one-month, three-month and six-month periods on a wholesale, senior, unsecured basis in large, internationally active banks. The rates generated by the preliminary Index methodology implicitly incorporate a number of distinct elements, including: an underlying U.S. dollar risk-free rate of return; a term structure for this risk-free rate to generate the various derived settings (i.e. the difference between the overnight risk-free rate and the expected average of that risk-free rate over a set time horizon); and an average credit risk premium that investors expect to earn for accepting wholesale, senior, unsecured bank credit risk over various time horizons.

In the context of the transition to SOFR as the preferred U.S. dollar risk-free rate benchmark, a number of market participants have suggested that IBA should construct the U.S. Dollar ICE Bank Yield Index from a combination of a term SOFR curve and a credit spread adjustment curve (i.e. as a credit-spread supplement to term SOFR).

The rationale for this approach is that the methodology would provide market participants with greater transparency as to the constituent elements of the Index and greater clarity regarding the different attributes of SOFR (an overnight risk-free rate in U.S. dollars) and the U.S. Dollar ICE Bank Yield Index (a credit risk-sensitive rate over multiple time horizons in U.S. dollars). Stakeholders have also suggested that building the Index as a credit-spread supplement to term SOFR would create an obvious connection between the two rates that could help inform and facilitate a more efficient transition away from U.S. dollar LIBOR.

IBA believes there is a strong analytical argument for separating the credit premium element of the U.S. Dollar ICE Bank Yield Index from underlying term risk-free rates. This approach acknowledges the different underlying dynamics of the credit and rates markets: credit trends generally evolve over longer time periods while interest rate expectations can change more rapidly based upon either realized rate changes or changes in expectations regarding monetary policy. It also allows separate curves to be constructed for each element using different data and methodologies to match these dynamics. Hence, the credit-spread curve methodology could incorporate multiple days' worth of credit-sensitive transaction data, which will likely lead to a more representative assessment of senior, unsecured bank credit risk in the wholesale funding markets over time. It also retains a nexus to U.S. dollar term risk-free rates, with a curve that could be updated daily based on realized SOFR data and transactional data relating to expected future SOFR settings.

Constructing the U.S. Dollar ICE Bank Yield Index as a Supplement to SOFR - A Potential Approach

In order to calculate the U.S. Dollar ICE Bank Yield Index as a credit-spread supplement to term SOFR, two key data inputs are necessary on a daily basis:

- An implied term SOFR yield curve that can generate implied term SOFR rates on a sustainable and representative basis for terms within the transaction collection range (currently up to one year); and
- Underlying transactional data representative of the yields available to investors in the wholesale market for senior, unsecured U.S. dollar bank debt obligations.

Once these inputs are available, credit spreads can be calculated by subtracting implied term SOFR rates from the underlying wholesale, senior, unsecured bank transaction yield data. If this process is repeated over a series of days (e.g. a rolling five-day period), a robust credit-spread curve can be created that would represent an average credit premium that investors would expect to earn above term risk-free rates for investing in the wholesale, senior, unsecured U.S. dollar debt obligations of large, internationally active banks.

This credit-spread curve can then be added back to the current implied term SOFR yield curve in order to produce settings that are representative of the average yields at which investors are willing to invest U.S. dollar funds on a senior, unsecured basis in large internationally active banks operating in the wholesale U.S. dollar markets for set time horizons.



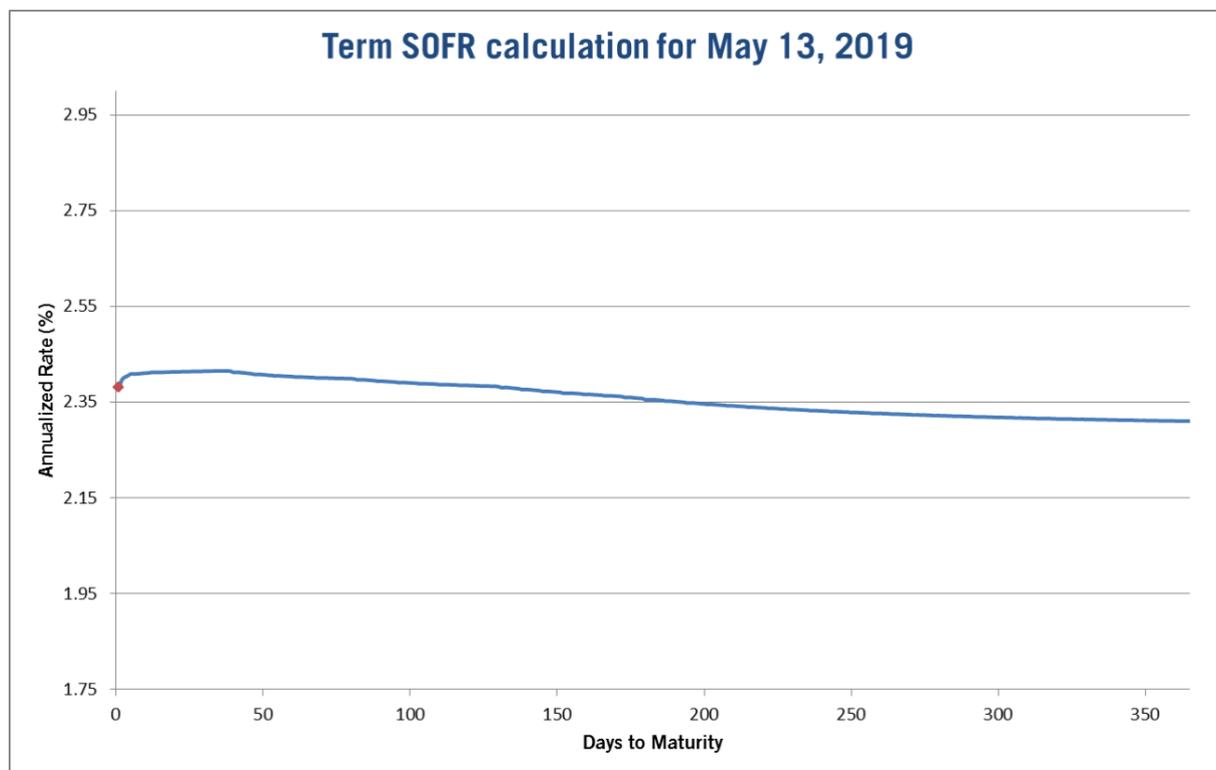
Calculating the Implied Term SOFR Yield Curve

For the purposes of this analysis, IBA has constructed an implied term SOFR⁶ yield curve and associated settings based on the methodology outlined in the recent Finance and Economics Discussion Series paper produced by the Board of Governors of the Federal Reserve System entitled “Inferring Term Rates from SOFR Futures Prices”⁷. In connection with the term SOFR rates it references, the paper includes a statement that, “These rates are presented for informational purposes only and are not appropriate for use as reference rates in financial contracts. The rates and the process by which they were calculated do not comply with the data quality, methodology, governance and other principles for financial benchmarks established by the International Organization of Securities Commissions. These rates may differ materially from any forward-looking term rates or averages of SOFR that may be produced in the future by any administrator, including any such rate that may be endorsed by the Alternative Reference Rates Committee”.

For this exercise, IBA has used settlement prices for both one-month and three-month SOFR futures contracts⁸.

An example of the implied term SOFR yield curve produced using this methodology is shown below:

Figure 1: Term SOFR calculation effective May 13, 2019



Calculating the Credit-Spread Curve

Primary market funding transaction and secondary market bond transaction data points are sourced, filtered and adjusted as per the preliminary Index methodology described in the white paper, with the following changes to the transaction eligibility criteria:

⁶ SOFR is published by the Federal Reserve Bank of New York (The New York Fed) and is used subject to The New York Fed's Term of Use (<https://www.newyorkfed.org/markets/reference-rates-terms-of-use>) for Select Rate Data. The New York Fed has no liability for your use of the data. The U.S. Dollar ICE Bank Yield Index is not associated with, endorsed or sponsored by The New York Fed.

⁷ Heitfield, Erik, and Yang-Ho Park (2019). “Inferring Term Rates from SOFR Futures Prices,” *Finance and Economics Discussion Series 2019-014*. Washington: Board of Governors of the Federal Reserve System.

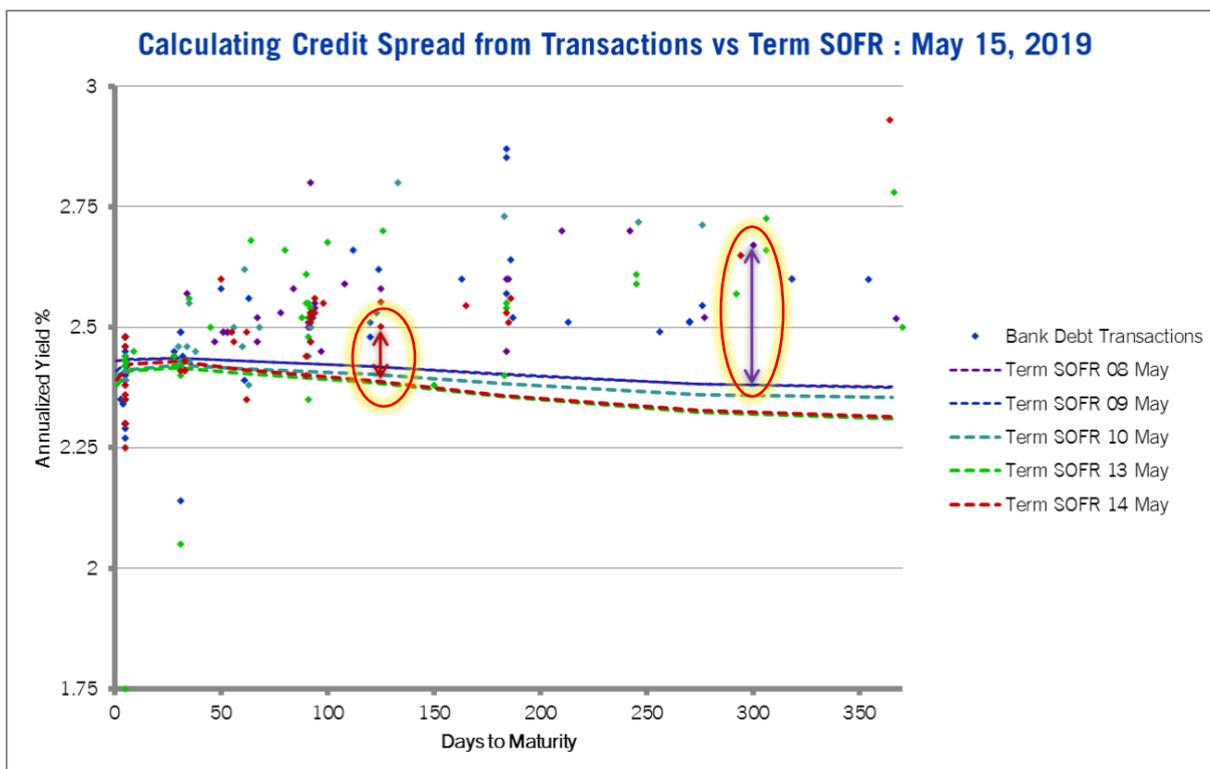
⁸ ICE Futures Europe One Month SOFR Index Future (<https://www.theice.com/products/70005423/ICE-Futures-Europe-One-Month-SOFR-Index-Future>) and ICE Futures Europe Three Month SOFR Index Future (<https://www.theice.com/products/70005442/ICE-Futures-Europe-Three-Month-SOFR-Index-Future>) settlement prices, published daily by ICE Futures Europe.



- The requirement for a funding transaction provider to have executed a minimum of two distinct transactions with a minimum of two distinct counterparties in order for any of that provider's transactions in a tenor bucket to be eligible for inclusion in the Index has been removed. The remaining criteria relating to minimum transaction size, counterparty type, product type, maturity and funding location continue to apply;
- Secondary market bond transactions may be included subject to a minimum size threshold of USD 5 million, rather than USD 2 million. The remaining criteria relating to issuance size, bond type, coupon range and maturity continue to apply, as do the weightings to ensure that no issuer represents more than 10% of the bond transactions involved in the construction of the Index; and
- Transactions that are executed on the current day and any of the four previous days are utilized, with no reduced weighting based on the age of the transaction. This will effectively generate a "five-day rolling average" credit-spread curve.

Term SOFR rates in respect of each applicable effective day are subtracted from each of the yields associated with the wholesale, senior, unsecured transaction data points for that day in order to produce implied credit spreads for each transaction. Example calculations are below:

Figure 2: Calculating credit spreads from transactions vs. Term SOFR, May 15, 2019



The transactions for each day are color-coded to match the implied term SOFR yield curve for the same day.

The **red** arrow highlights an example calculation of the credit spread for a single transaction executed on the previous day:

- Transaction date: May 14, 2019
- Maturity: September 18, 2019 (125 days to maturity)
- Transaction yield (adjusted to money market basis): 2.5015%
- 125 day term SOFR effective May 14, 2019: 2.3889%
- **Transaction Credit Spread = 2.5015% - 2.3889% = 0.1126% (11.26 bps)**

The **purple** arrow highlights an example calculation of the credit spread for a single transaction executed on an earlier day:

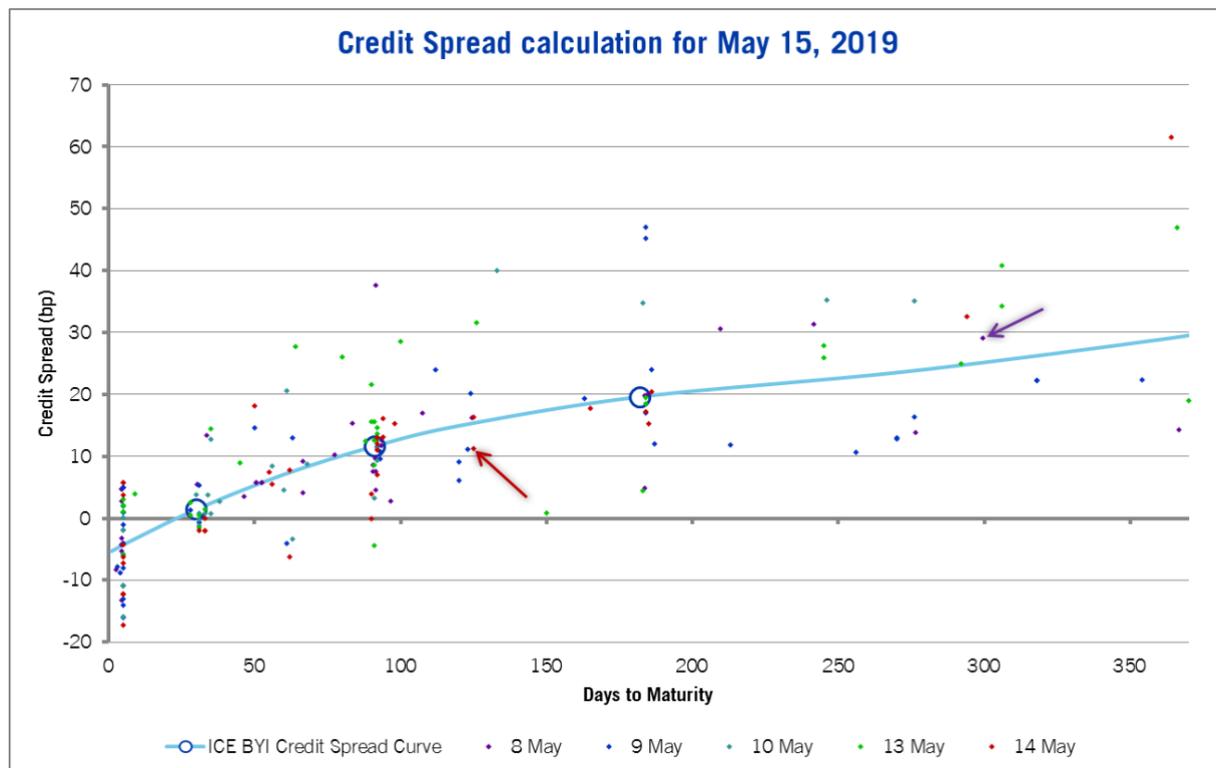
- Transaction date: May 8, 2019



- Maturity: March 5, 2020 (300 days to maturity)
- Transaction yield (adjusted to money market basis): 2.6704%
- 300 day term SOFR effective May 8, 2019: 2.3797%
- **Transaction Credit Spread = 2.6704% - 2.3797% = 0.2907% (29.07 bps)**

These credit spreads, taken together on a rolling five-day basis, are plotted and a robust regression algorithm is applied to generate a credit-spread curve. The required one-month, three-month and six-month credit-spread settings are then determined from this curve, as shown on the next chart: The arrows on the chart indicate the credit spreads derived from the transactions highlighted in the same color on the previous chart.

Figure 3: Credit spread calculation for May 15, 2019

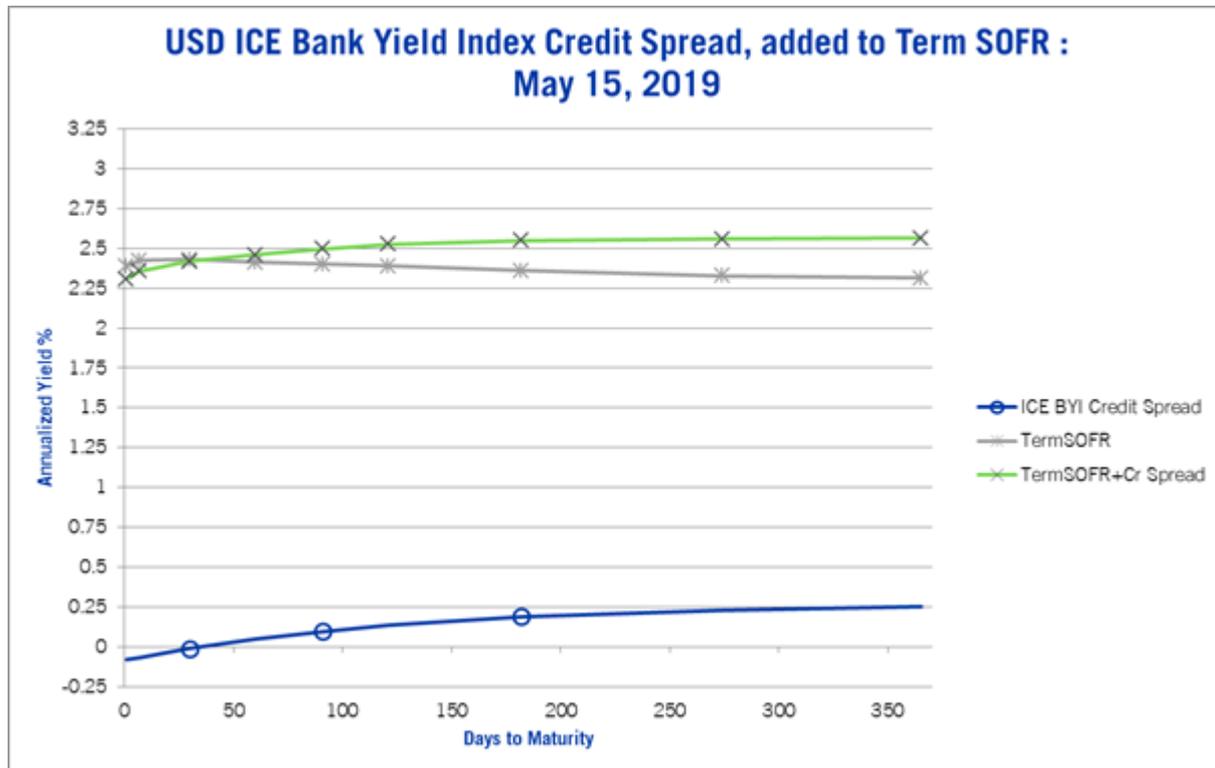




Calculating the Composite U.S. Dollar ICE Bank Yield Index Curve

This credit-spread curve can then be added to the current implied term SOFR yield curve (i.e. for SOFR effective May 14, 2019) to produce the composite U.S. Dollar ICE Bank Yield Index curve.

Figure 4: U.S. Dollar ICE Bank Yield Index credit spread added to Term SOFR, May 15, 2019



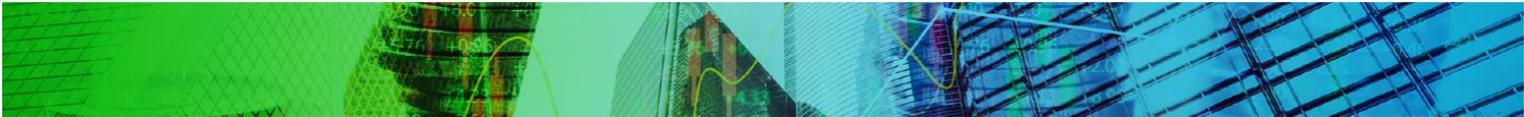
Example Calculation Results

IBA has calculated the implied term SOFR yield and credit-spread curves, using the above-described method, for the period from April 23, 2019, to June 28, 2019. The transaction counts and volumes used in the calculations are summarized in the table below:

Figure 5: Transaction counts and volumes

Transaction Type	Average Number of Transactions (per day)	Average Individual Transaction Volume	Average Aggregate Transaction Volume (per day)
Primary Market Funding Transactions	175.8	USD 102 Million	USD 18.0 Billion
Secondary Market Bond Transactions	45.7	(>USD 5 Million)*	(Unknown)*
Total Transactions (All Types)	221		(> USD 18.2 Billion)⁹

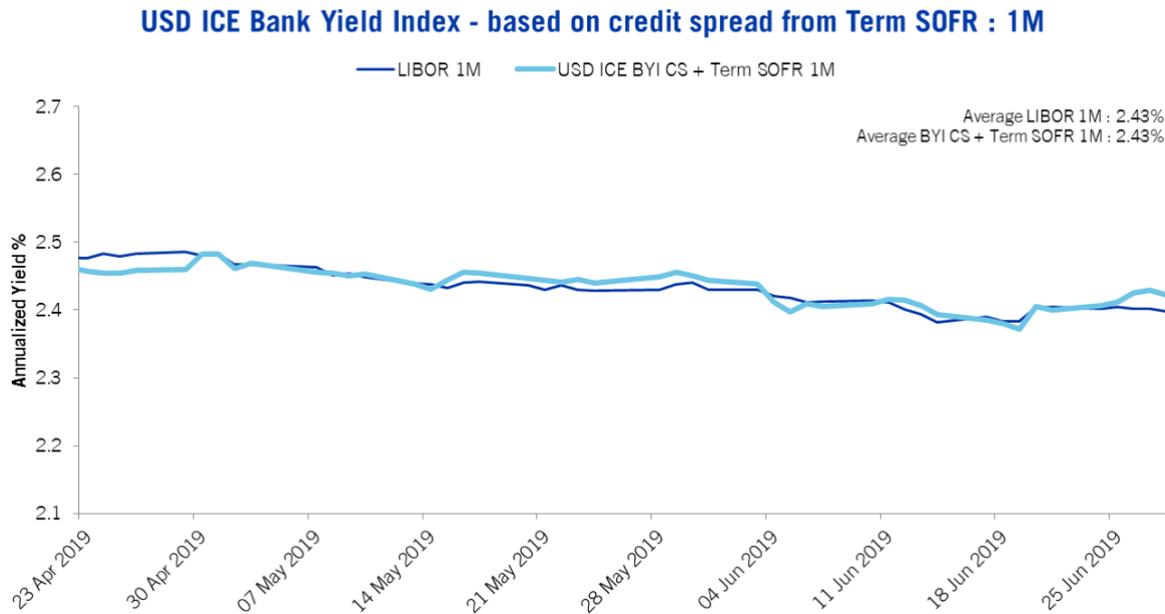
⁹ For bond trades in excess of USD 5m in size, the trade volume is reported in TRACE as ">5MM". Enhanced data containing actual trade volumes is only published by FINRA™ after a 6 month delay. Historical data from 2018 shows that, in the instruments eligible* for the U.S. Dollar ICE Bank Yield Index, the average size of trades over USD 5m was approximately USD 14m.



The following charts illustrate the rates derived over the period from the combined curves obtained by adding the credit-spread curves to the implied term SOFR yield curves. They are shown together with the corresponding U.S. dollar LIBOR settings for the same time period.¹⁰

In Appendix 1, tables are provided with more granular detail on the test results by day.

Figure 6: U.S. Dollar ICE Bank Yield Index based on credit spread from Term SOFR: 1 Month



¹⁰ Note that U.S. dollar LIBOR and the U.S. Dollar ICE Bank Yield Index are produced using different methodologies and different data sources. As a result, care should be taken when comparing U.S. dollar LIBOR and the U.S. Dollar ICE Bank Yield Index for any period, including the period of testing.



Figure 7: U.S. Dollar ICE Bank Yield Index based on credit spread from Term SOFR: 3 Month

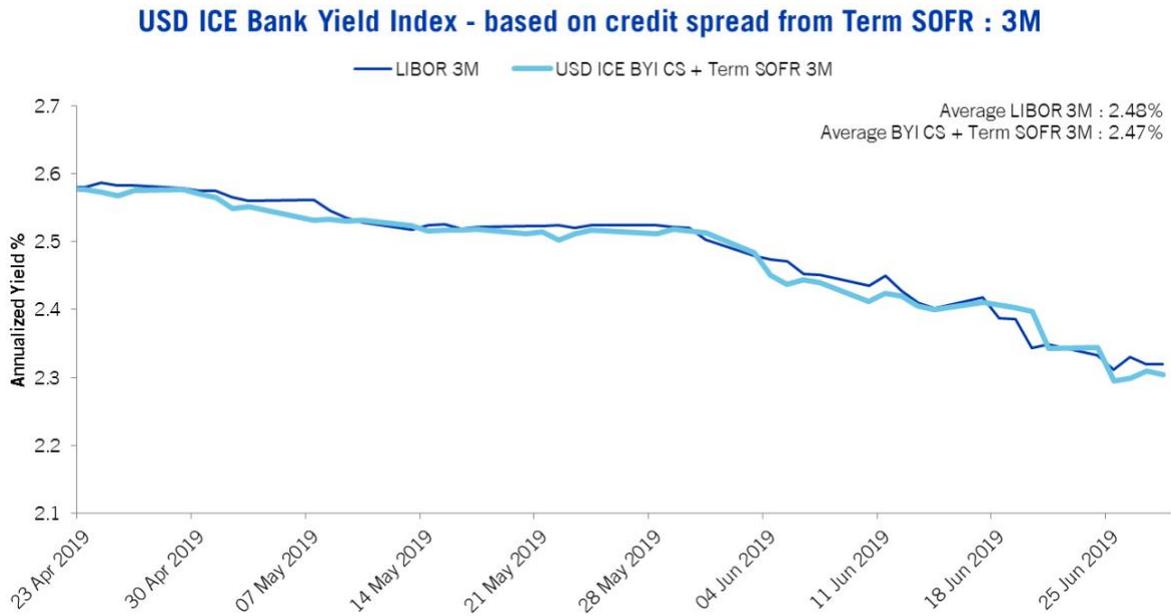
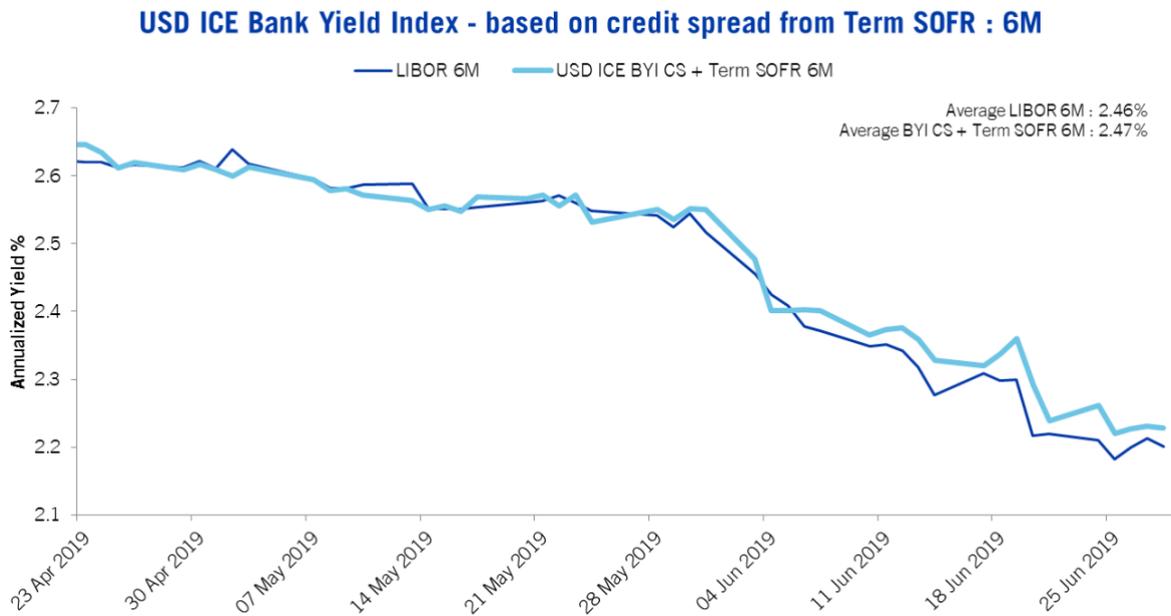


Figure 8: U.S. Dollar ICE Bank Yield Index based on credit spread from Term SOFR: 6 Month





Conclusions

Based upon the positive preliminary calculation results, encouraging market feedback and the strong supporting rationale (including the increased quantity of transactional data underpinning the credit-spread calculation), IBA now proposes to further explore constructing the U.S. Dollar ICE Bank Yield Index as a credit-spread supplement to term SOFR.

IBA expects the separation of the credit premium and risk-free rate elements of the curve construction process, together with the use of a multi-day observation period to establish the credit-spread curve, to better reflect evolving credit and rate market conditions. In addition, the use of five days' worth of credit-sensitive transaction data should increase the quantity and diversity of information that will be used to produce the Index. IBA believes this approach should help to ensure the Index remains representative of underlying wholesale, senior, unsecured bank funding market conditions in periods of volatility and in less liquid market conditions.

Feedback Questions

IBA is asking for stakeholder feedback on using this methodology to calculate the U.S. Dollar ICE Bank Yield Index as a credit-spread supplement to term SOFR, in order to understand whether market participants would prefer IBA to pursue this methodology rather than the preliminary methodology set out in the [white paper](#).

Please see below the questions on which IBA is requesting feedback from market participants.

Respondents are requested to provide their feedback by email to IBA at IBA@theice.com on or before September 30, 2019.

1. Do you consider the calculation of a credit-spread curve as a supplement to term SOFR to be preferable to the U.S. Dollar ICE Bank Yield Index methodology as previously detailed in the white paper?
2. Do you agree with the proposed approach of including credit-spread information for all eligible transactions over a five-day period, rather than the approach previously described in the white paper of using up to five previous day's transactions only so far as needed to achieve the target number of transactions for a maturity range? Do you agree with using a five-day transaction window, or should a shorter or longer period be used?
3. Should IBA establish a minimum volume and/or transaction count standard that needs to be met to construct the credit-spread curve over a five-day (or other appropriate) transaction window? If so, please provide feedback as to what the minimum volume and/or transaction count should be (e.g. a minimum volume target of \$15 billion and/or 150 discrete transactions). If this standard is not met during the relevant transaction window, then should IBA use data from a longer time period until such point as the credit-spread curve can be constructed with enough data points to meet the standard (i.e. potentially use six, seven, eight, etc. days' worth of data until the minimum standard is met)?
4. Do you agree with the approach of not weighting the credit-spreads for previous days' transactions by reference to their age in consideration of the less volatile nature of credit spreads over short periods of time, rather than the approach previously described of ascribing more recently-executed trades greater weight in the calculation?
5. Do you agree with the proposed methodology for deriving an implied term SOFR yield curve, based on futures settlement prices?
6. Do you consider that the calculation methodology should continue to use an input data window ending shortly before publication (such as the period between 11:00 am and 11:00 am UK time on consecutive business days), or should the input data window be aligned to calendar days (i.e. the period between 12:00 midnight and 12:00 midnight Eastern Time on consecutive business days, as for SOFR)?
7. Please provide any other feedback you have on this proposed methodology.

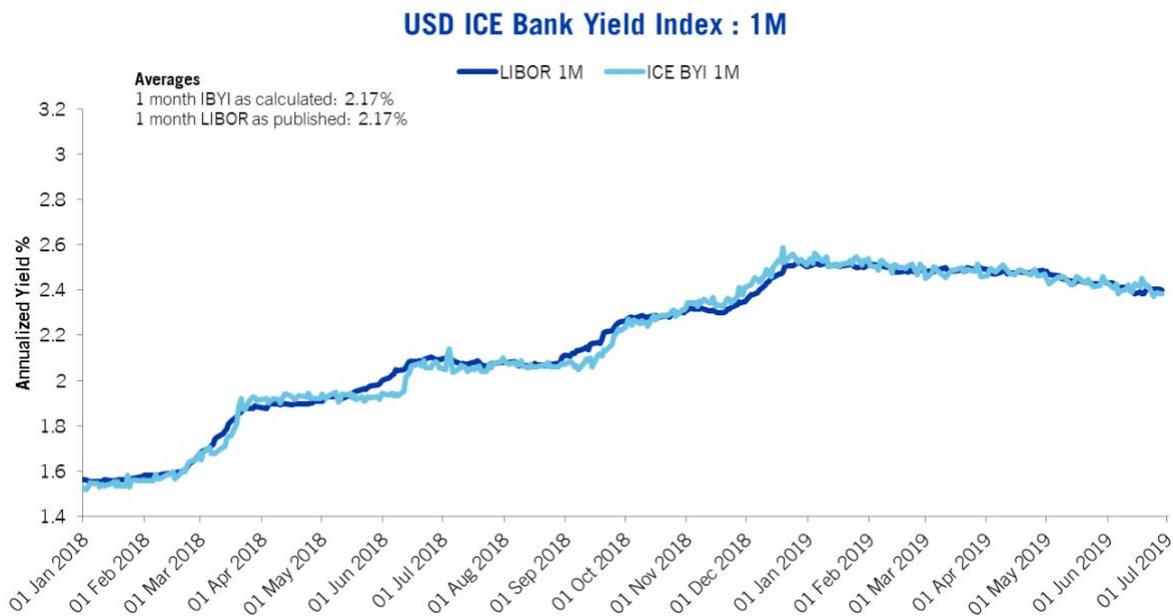


Testing Results to end of June, 2019

Since the previous [update](#), IBA has continued to calculate the U.S. Dollar ICE Bank Yield Index using the preliminary Index methodology described in the [white paper](#).

Line charts showing one-month, three-month and six-month settings for the U.S. Dollar ICE Bank Yield Index, during the period from January 1, 2018, to June 28, 2019, are shown in Figures 9, 10 and 11 below, together with the corresponding U.S. dollar LIBOR settings for the same period¹¹. The results are also available in CSV format on IBA's [website](#).

Figure 9: U.S. Dollar ICE Bank Yield Index: 1 Month



¹¹ Note that U.S. dollar LIBOR and the U.S. Dollar ICE Bank Yield Index are produced using different methodologies and different data sources. As a result, care should be taken when comparing U.S. dollar LIBOR and the U.S. Dollar ICE Bank Yield Index for any period, including the period of testing.

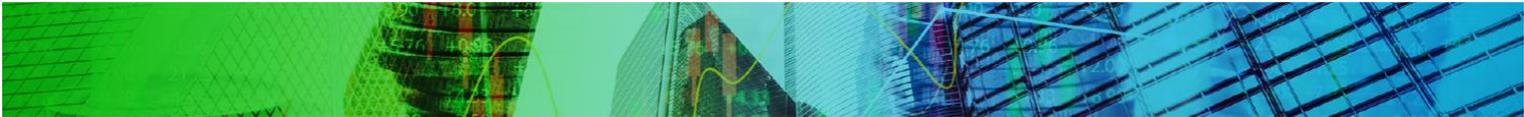


Figure 10: U.S. Dollar ICE Bank Yield Index: 3 Month

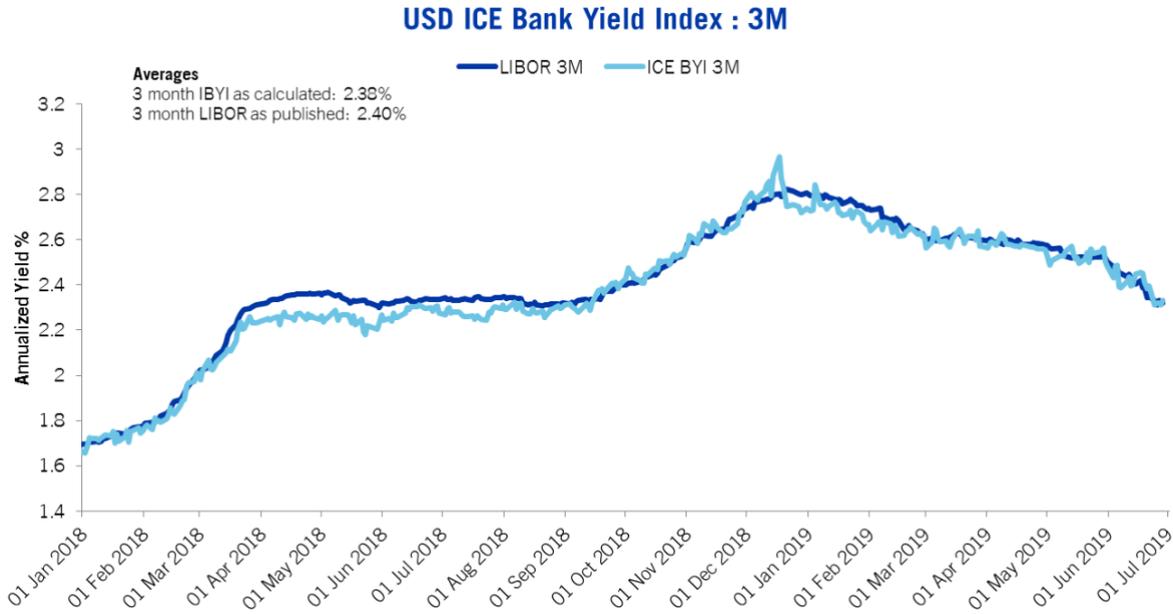
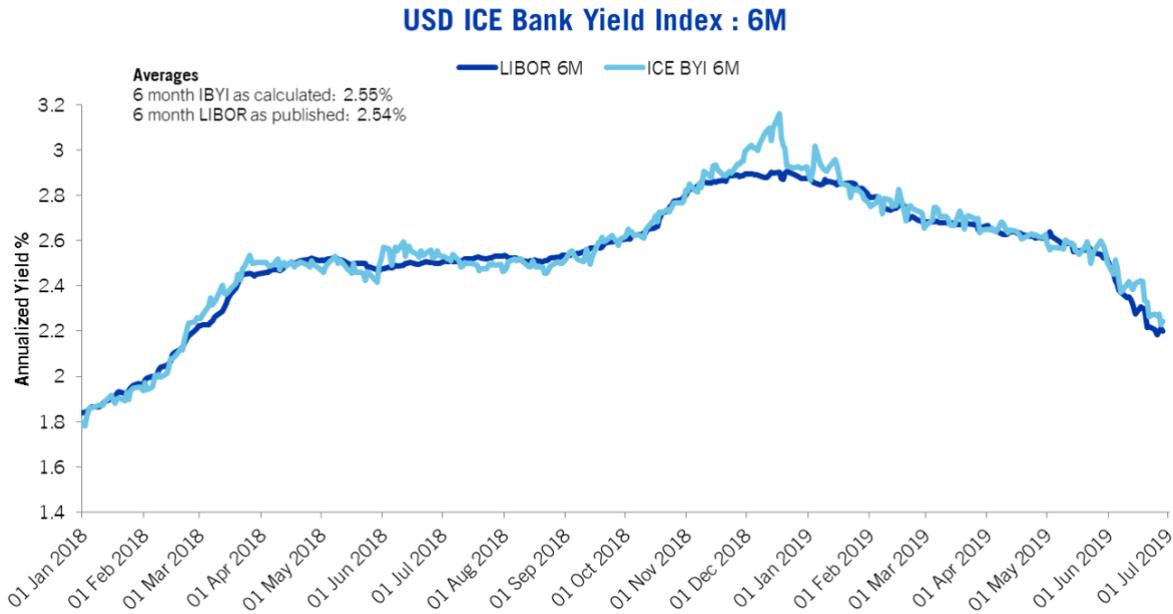


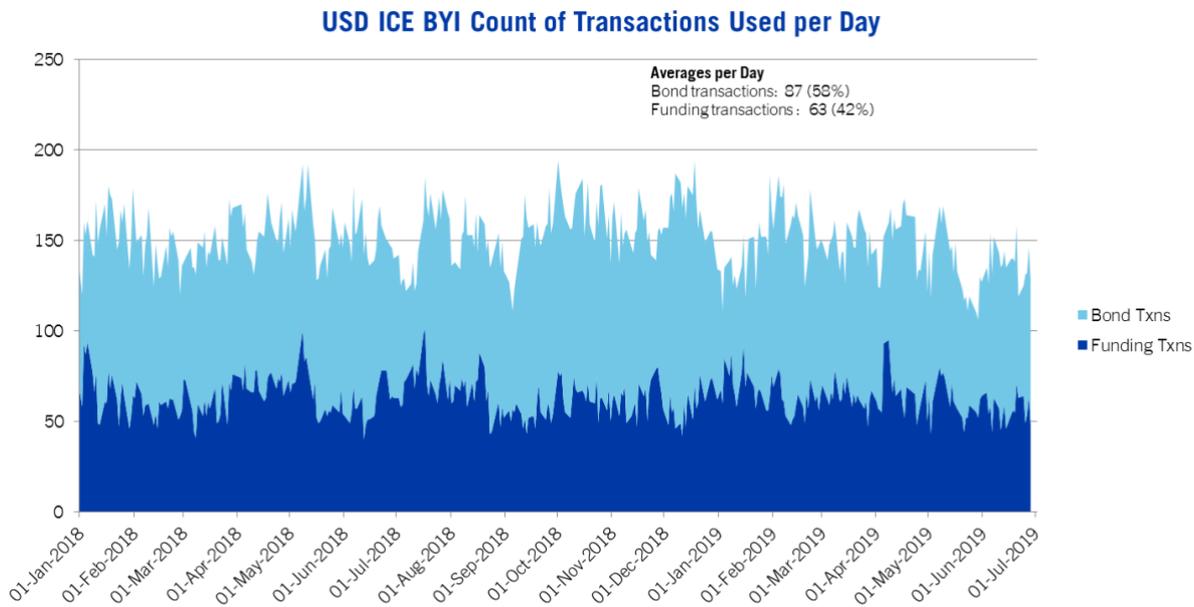
Figure 11: U.S. Dollar ICE Bank Yield Index: 6 Month



The average daily quantity of input data transactions during the updated testing period, and volumes represented by these, are consistent with those seen in respect of the previous testing periods as referred to in the [white paper](#) and [first update](#).

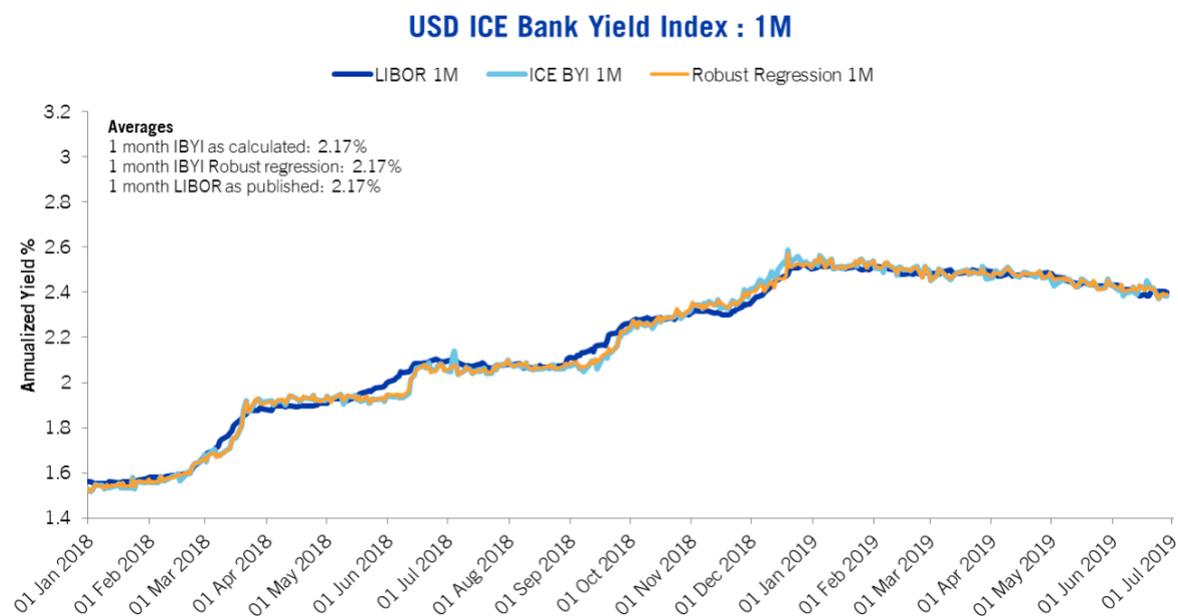


Figure 12: U.S. Dollar ICE Bank Yield Index Count of Transactions used per day



IBA has also continued to perform the equivalent calculation using a robust regression algorithm, which is less affected by outlier data points. The results are shown in the following three charts¹².

Figure 13: U.S. Dollar ICE Bank Yield Index: 1 Month



¹² Note that U.S. dollar LIBOR and the U.S. Dollar ICE Bank Yield Index are produced using different methodologies and different data sources. As a result, care should be taken when comparing U.S. dollar LIBOR and the U.S. Dollar ICE Bank Yield Index for any period, including the period of testing.



Figure 14: U.S. Dollar ICE Bank Yield Index: 3 Month

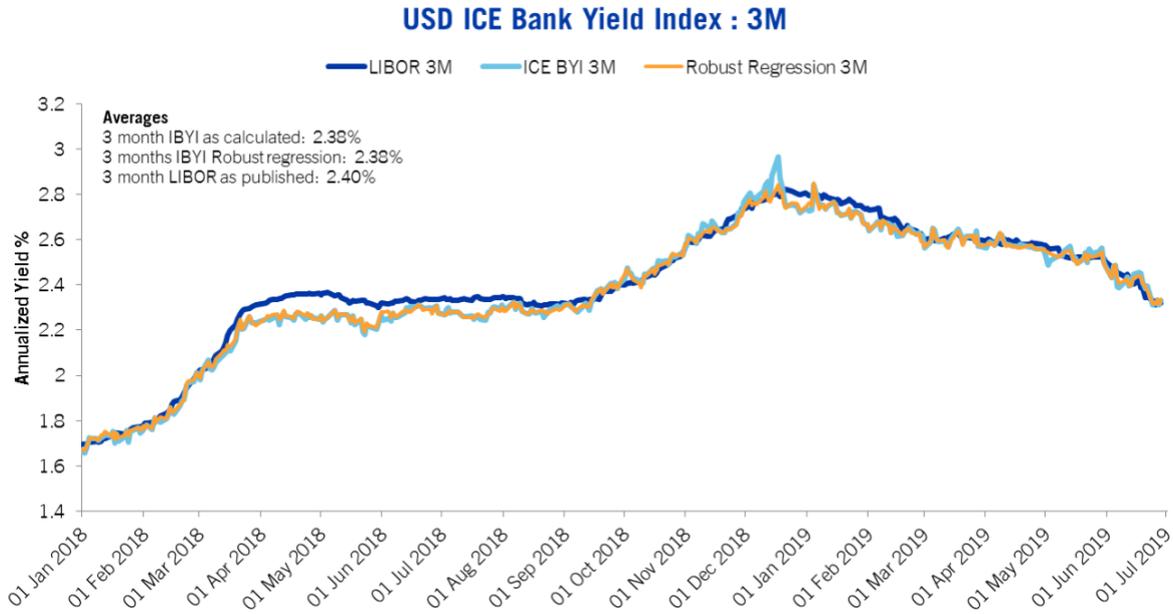
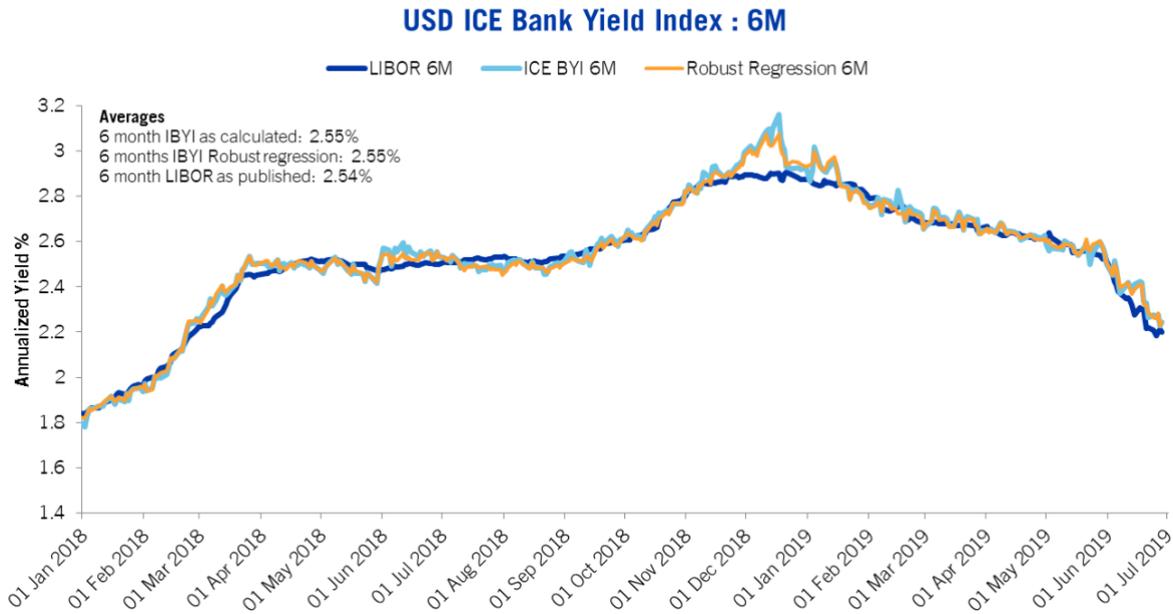


Figure 15: U.S. Dollar ICE Bank Yield Index: 6 Month





Appendix 1 - The U.S. Dollar ICE Bank Yield Index as a Supplement to Term SOFR Test Results

Publication Date	1 Month			3 Months			6 Months		
	Term SOFR	ICE BYI Credit Spread	Term SOFR + Spread	Term SOFR	ICE BYI Credit Spread	Term SOFR + Spread	Term SOFR	ICE BYI Credit Spread	Term SOFR + Spread
Apr 23, 2019	2.452	0.5 bps	2.457	2.445	13.3 bps	2.577	2.432	21.5 bps	2.646
Apr 24, 2019	2.446	0.8 bps	2.454	2.438	13.5 bps	2.573	2.417	21.7 bps	2.634
Apr 25, 2019	2.447	0.7 bps	2.454	2.434	13.4 bps	2.568	2.403	20.9 bps	2.612
Apr 26, 2019	2.453	0.5 bps	2.458	2.442	13.4 bps	2.576	2.414	20.6 bps	2.619
Apr 29, 2019	2.449	1.1 bps	2.460	2.437	14.0 bps	2.577	2.401	20.8 bps	2.609
Apr 30, 2019	2.455	2.8 bps	2.483	2.438	13.2 bps	2.571	2.403	21.4 bps	2.617
May 01, 2019	2.451	3.2 bps	2.482	2.440	12.5 bps	2.565	2.401	20.8 bps	2.609
May 02, 2019	2.439	2.2 bps	2.462	2.429	12.0 bps	2.549	2.394	20.6 bps	2.599
May 03, 2019	2.448	2.1 bps	2.469	2.444	10.7 bps	2.551	2.423	19.0 bps	2.613
May 07, 2019	2.433	2.2 bps	2.456	2.430	10.2 bps	2.532	2.414	18.0 bps	2.594
May 08, 2019	2.436	1.8 bps	2.455	2.426	10.7 bps	2.533	2.401	17.7 bps	2.578
May 09, 2019	2.436	1.4 bps	2.451	2.425	10.5 bps	2.531	2.403	17.7 bps	2.580
May 10, 2019	2.437	1.7 bps	2.453	2.425	10.6 bps	2.531	2.402	17.0 bps	2.571
May 13, 2019	2.422	1.7 bps	2.439	2.407	11.6 bps	2.523	2.384	18.0 bps	2.564
May 14, 2019	2.415	1.5 bps	2.430	2.394	12.2 bps	2.516	2.356	19.4 bps	2.550
May 15, 2019	2.430	1.4 bps	2.444	2.400	11.6 bps	2.517	2.359	19.6 bps	2.555
May 16, 2019	2.445	1.1 bps	2.455	2.406	11.1 bps	2.517	2.357	19.1 bps	2.548
May 17, 2019	2.449	0.5 bps	2.455	2.414	10.4 bps	2.518	2.369	20.0 bps	2.570
May 20, 2019	2.443	0.3 bps	2.446	2.410	10.1 bps	2.511	2.368	19.8 bps	2.566
May 21, 2019	2.452	-0.8 bps	2.444	2.418	9.6 bps	2.515	2.377	19.5 bps	2.572
May 22, 2019	2.447	-0.5 bps	2.442	2.419	8.3 bps	2.502	2.388	16.8 bps	2.556
May 23, 2019	2.454	-0.9 bps	2.445	2.428	8.4 bps	2.512	2.392	18.0 bps	2.572
May 24, 2019	2.457	-1.7 bps	2.440	2.423	9.4 bps	2.517	2.367	16.5 bps	2.532
May 28, 2019	2.453	-0.4 bps	2.449	2.429	8.3 bps	2.512	2.381	16.9 bps	2.550
May 29, 2019	2.461	-0.4 bps	2.456	2.432	8.7 bps	2.519	2.376	16.0 bps	2.535
May 30, 2019	2.469	-1.8 bps	2.451	2.434	8.1 bps	2.516	2.369	18.2 bps	2.551
May 31, 2019	2.464	-2.1 bps	2.443	2.432	8.1 bps	2.513	2.365	18.6 bps	2.551
Jun 03, 2019	2.456	-1.7 bps	2.439	2.405	8.0 bps	2.484	2.311	16.7 bps	2.478
Jun 04, 2019	2.436	-2.4 bps	2.412	2.372	7.9 bps	2.451	2.236	16.5 bps	2.401
Jun 05, 2019	2.423	-2.6 bps	2.397	2.355	8.2 bps	2.437	2.211	19.1 bps	2.402
Jun 06, 2019	2.427	-1.7 bps	2.409	2.351	9.3 bps	2.444	2.196	20.7 bps	2.403
Jun 07, 2019	2.419	-1.4 bps	2.406	2.351	8.9 bps	2.440	2.201	20.0 bps	2.401
Jun 10, 2019	2.419	-1.0 bps	2.409	2.315	9.7 bps	2.412	2.151	21.3 bps	2.365
Jun 11, 2019	2.419	-0.3 bps	2.416	2.325	9.8 bps	2.423	2.171	20.3 bps	2.374
Jun 12, 2019	2.425	-1.0 bps	2.415	2.331	8.9 bps	2.420	2.187	18.9 bps	2.376
Jun 13, 2019	2.418	-1.2 bps	2.406	2.309	9.7 bps	2.406	2.168	19.1 bps	2.359
Jun 14, 2019	2.407	-1.4 bps	2.393	2.291	10.9 bps	2.399	2.126	20.2 bps	2.329
Jun 17, 2019	2.401	-1.6 bps	2.385	2.292	11.9 bps	2.411	2.131	18.9 bps	2.320
Jun 18, 2019	2.400	-2.0 bps	2.380	2.286	12.1 bps	2.407	2.136	20.2 bps	2.338
Jun 19, 2019	2.390	-1.8 bps	2.372	2.275	12.7 bps	2.402	2.131	22.9 bps	2.360
Jun 20, 2019	2.409	-0.4 bps	2.405	2.265	13.2 bps	2.397	2.083	20.9 bps	2.292
Jun 21, 2019	2.406	-0.7 bps	2.399	2.229	11.3 bps	2.343	2.033	20.6 bps	2.239
Jun 24, 2019	2.408	-0.2 bps	2.406	2.242	10.2 bps	2.344	2.055	20.6 bps	2.261
Jun 25, 2019	2.412	0.1 bps	2.412	2.207	8.8 bps	2.295	2.016	20.4 bps	2.221
Jun 26, 2019	2.410	1.5 bps	2.425	2.213	8.7 bps	2.299	2.024	20.3 bps	2.227
Jun 27, 2019	2.418	1.2 bps	2.430	2.226	8.3 bps	2.309	2.052	17.9 bps	2.230
Jun 28, 2019	2.408	1.5 bps	2.423	2.206	9.7 bps	2.304	2.036	19.2 bps	2.228



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