



U.S. Dollar ICE Bank Yield Index Update

April 2019



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Executive Summary

ICE Benchmark Administration (IBA), a leading provider of global interest rate and other financial benchmarks, introduced the U.S. Dollar ICE Bank Yield Index in a [white paper](#) published on January 24, 2019. This new interest rate index has been 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 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 transaction-based term 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, unsecured bank investment yields: primary market funding transactions and secondary market bond transactions. These transactions are filtered by reference to specified eligibility criteria and 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 also 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 is now publishing this update to the white paper in order to:

1. Provide more detailed information regarding certain aspects of its proposals for the U.S. Dollar ICE Bank Yield Index, in light of feedback received to date.

The feedback has generally focused on the following areas:

- the criteria for identifying the eligible primary market funding and secondary market bond transactions that are used to construct the daily yield curves, and the associated transaction volumes;
- weightings of primary market funding transaction data compared with secondary market bond transaction data in the index methodology;
- the methodology used to generate the daily yield curves from which the term settings are obtained; and
- contingencies in the event that insufficient input data points are available in order to generate one-month, three-month and six-month settings based upon the index methodology.

Further details regarding these aspects of the index are provided in the *Main areas of Feedback* section of this update.

2. Provide market participants with updated results of testing the preliminary U.S. Dollar ICE Bank Yield Index methodology during the period from January 2018 to the end of March 2019.

These results are set out in the *Updated Testing Results* section of this update and on IBA’s [website](#). To date, the index has shown a close correlation with other benchmark rates, such as U.S. dollar LIBOR, that seek to measure short-term, unsecured investment yields in respect of large financial institutions in the U.S. dollar money markets.

3. Extend the period in respect of which IBA is seeking feedback on the U.S. Dollar ICE Bank Yield Index to May 31, 2019.

This will give market participants more time to consider and respond in respect of the preliminary index methodology, the additional points covered in this update and the updated test results. IBA is setting out updated feedback questions in the *Updated Feedback Questions* section of this update.



IBA intends to consider and take account of the feedback received to date and any new responses before finalizing the U.S. Dollar ICE Bank Yield Index methodology and undertaking a period of production-standard testing. If the market's response remains encouraging, future testing is successful and global banks continue to support the index, IBA anticipates launching the index in 2020.

Please note that 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.



Background, Rationale and Index Methodology

Background

ICE Benchmark Administration (IBA), a regulated benchmark administrator¹ and subsidiary of Intercontinental Exchange, Inc., has developed a preliminary methodology for a new interest rate index (the U.S. Dollar ICE Bank Yield Index or the “Index”). The U.S. Dollar ICE Bank Yield Index seeks to measure the average yields at which investors are willing to invest U.S. dollar funds for one-month, three-month and six-month periods on a senior, unsecured and uninsured basis in large, internationally active banks operating in the wholesale U.S. dollar markets.

The Index has been designed to meet the potential requirements of lenders, borrowers and other non-derivative (or “cash”) market participants that have historically referenced U.S. dollar LIBOR and other transaction-based, interest rate term benchmarks linked to the average funding rates of a broad group of large banks in their contracts.

IBA published a [white paper](#) introducing the U.S. Dollar ICE Bank Yield Index on January 24, 2019, together with the results of a period of testing the preliminary Index methodology during the course of 2018, and asked market participants for their feedback.

Rationale for the Index

Regulators have advised market participants of the need to transition new and outstanding contracts in all markets away from LIBOR to alternative rates by the end of 2021². Although derivatives market participants are generally expected to be able to effect this transition without too much difficulty³, participants in lending and other cash markets may face greater challenges because of the importance placed by such users on certain features of their current interest rate benchmarks⁴. These features include:

- the incorporation of an average bank’s marginal unsecured funding costs, which enables banks to price loans primarily based upon an assessment of a borrower’s creditworthiness, rather than a bank’s individual funding profile and results in a rate that generally moves in the same direction as a lender’s own marginal sources of funding;
- the connection to an average unsecured funding rate of a broad group of large banks, which avoids the need for a borrower to take the cost-of-funds risk of their specific lender or a small or concentrated group of lenders; and
- the availability of key, forward-looking term settings, which provides certainty when setting rates at the outset of an accrual period and is a requirement for certain budgeting and risk management exercises and in many operational systems.

Market participants and regulators have also placed a strong emphasis on having transactions, rather than judgement, underpin the calculation methodologies of interest rate benchmarks to the greatest extent possible.

Preliminary Index Methodology

IBA has designed the U.S. Dollar ICE Bank Yield Index⁵ in order to seek to address these potential challenges and requirements.

The Index is derived wholly from two types of U.S. dollar-denominated transactional input data, filtered by reference to specified eligibility criteria⁶, in order to ensure both it and the Index are representative of the underlying economic reality the Index seeks to measure (i.e. the average yields at which investors are willing to make short-term, unsecured U.S. dollar investments in large banks). The input data consists of:

¹ IBA is authorised and regulated by the FCA as a benchmark administrator under the EU Benchmarks Regulation (Regulation (EU) 2016/1011 of the European Parliament and the Council of June 8, 2016 on indices used as benchmarks and financial contracts or to measure the performance of investment Funds)

² <https://www.fca.org.uk/news/speeches/interest-rate-benchmark-reform-transition-world-without-libor> , <http://www.fsb.org/wp-content/uploads/P120718.pdf>. The UK Financial Conduct Authority (the FCA) intends that it will no longer be necessary for it to sustain LIBOR through its influence or legal powers beyond 2021. See, <https://www.fca.org.uk/news/speeches/the-future-of-libor>

³ See, for example, <https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2018/ARRC-Second-report>

⁴ See, for example, https://www.bis.org/publ/qtrpdf/r_qt1903e.pdf

⁵ See Appendix 1 (Draft Term Sheet) of the [U.S. Dollar ICE Bank Yield Index white paper](#) for further details on the preliminary Index methodology

⁶ See Appendix 1 (Draft Term Sheet) of the [U.S. Dollar ICE Bank Yield Index white paper](#) for details of the transaction eligibility criteria



- wholesale, primary market funding transactions executed by large, internationally active banks (e.g. inter-bank deposits, institutional certificates of deposit and commercial paper) sourced daily from, at present, 13 large, internationally active banks⁷; and
- secondary market transactions in wholesale, unsecured bonds issued by, at present, 30 large, internationally active banking groups, sourced daily from the Financial Industry Regulatory Authority's™ (FINRA™) Trade Reporting and Compliance Engine™ (TRACE™)⁸.

All eligible transaction data executed during the input window for a given day⁹ is sorted by days to maturity (of the funding transaction or the relevant bond) and allocated to specified maturity ranges from one week up to one year. Each maturity range has a target number of transactions for allocation and, where this is not achieved using data from the current day's input window, eligible transaction data from up to five previous days may be used to do this¹⁰.

IBA assigns a weighting of 100 percent to each eligible primary market funding transaction and 50 percent to each eligible secondary market bond transaction¹¹. The rationale for assigning a greater weighting to primary market funding data is that these transactions tend to be of a larger size than secondary market transactions in bank bonds, and should lead to a rate that better represents where investors are willing to invest in the unsecured credit of large, internationally active banks. Previous days' transactions, where used, are also assigned a reduced weighting relative to the current day's transactions and adjusted by reference to movements in market rates (e.g. Overnight Index Swaps / OIS) since the date of execution¹². Eligible bond transactions are also weighted, where necessary, to ensure that no single bond issuer represents over 10 percent of the bond transactions used to construct the Index for any given day¹³. All bond transaction data is converted to an annualized money market basis.

All eligible primary market funding and secondary market bond transactions (weighted, adjusted and/or converted, as applicable) are used to construct a yield curve using a weighted least squares regression to a third order polynomial¹⁴. The yield curve seeks to measure the average yields at which investors are willing to invest U.S. dollar funds on a senior, unsecured basis in large banks for a time horizon of up to one year. Forward-looking settings for one-month, three-month and six-month tenors may then be obtained from the curve, provided that the target number of transactions within the maturity range associated with the relevant publication tenor has been achieved¹⁵.

See Figures 1 and 2 below for an example of how the yield curve (light blue line) is fitted to the eligible transaction data points (grey dots) and how the term settings are obtained.

⁷ 81 percent of USD LIBOR panel banks have consented to IBA using their funding transaction data for the period of testing. IBA intends to seek additional large, internationally active banks that are willing to provide funding transaction data for the purposes of calculating the Index. See note on *Potential Adjustments to the Input Data Eligibility Criteria in order to Increase Transaction Volumes* below for further information

⁸ 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

⁹ This constitutes transactions executed at any time from 11:00am (London time) / 6:00am (New York time) on the previous calculation day through to 11:00am (London time) / 6:00am (New York time) on the current calculation day. Note that these times will change as the time difference between New York time and London time varies throughout the year

¹⁰ i.e. transactions executed during input windows for up to five previous calculation days

¹¹ See note on *Weightings of Funding Transaction Data Compared with Bond Transaction Data in the Index* below for further information and some potential alternative weightings based upon feedback from stakeholders

¹² This is designed to result in the utilization of more input data that is representative of yields associated with unsecured bank investments in order to construct the Index, whilst also ensuring the impact of this data is appropriate and that the Index remains responsive to market changes occurring on a day-to-day basis

¹³ This is done to reduce the risk that trading in one particular bank's bonds might unduly influence the Index on any given day

¹⁴ See note on *The Methodology Used to Generate the Daily Yield Curves Underlying the Index* below for further information and some potential alternative curve-fitting approaches

¹⁵ If the target number of transactions is not achieved for a maturity range associated with a publication tenor (one-month, three-month or six-month), then the administrator would not obtain and publish a setting for this tenor from the yield curve. The administrator would instead publish a contingency rate in respect of that tenor (See Appendix 1 (*Draft Term Sheet*) of the [U.S. Dollar ICE Bank Yield Index white paper](#) for further details). Also see note on *Contingencies in the Event that Insufficient Input Data Points are Available in order to Generate One-month, Three-month and Six-month Settings Based upon the Index Methodology* below for further information and some potential alternative contingency approaches



Figure 1: Curve-fitting and deriving term settings for July 16, 2018

USD ICE Bank Yield Index for 16-Jul-2018

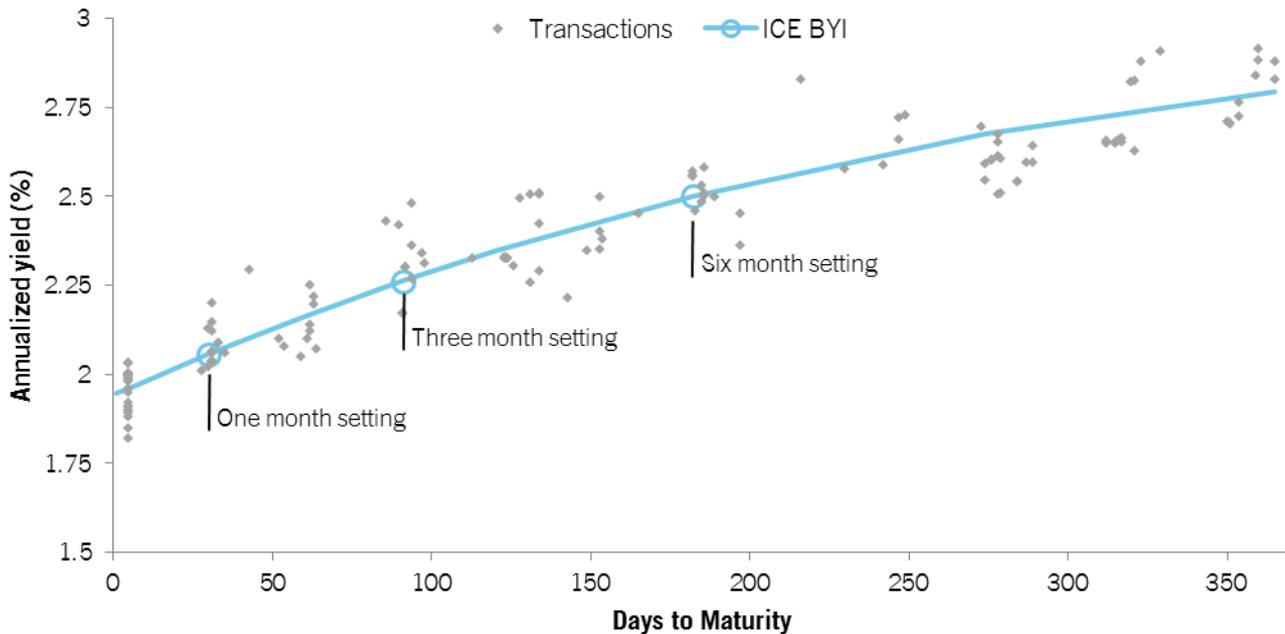
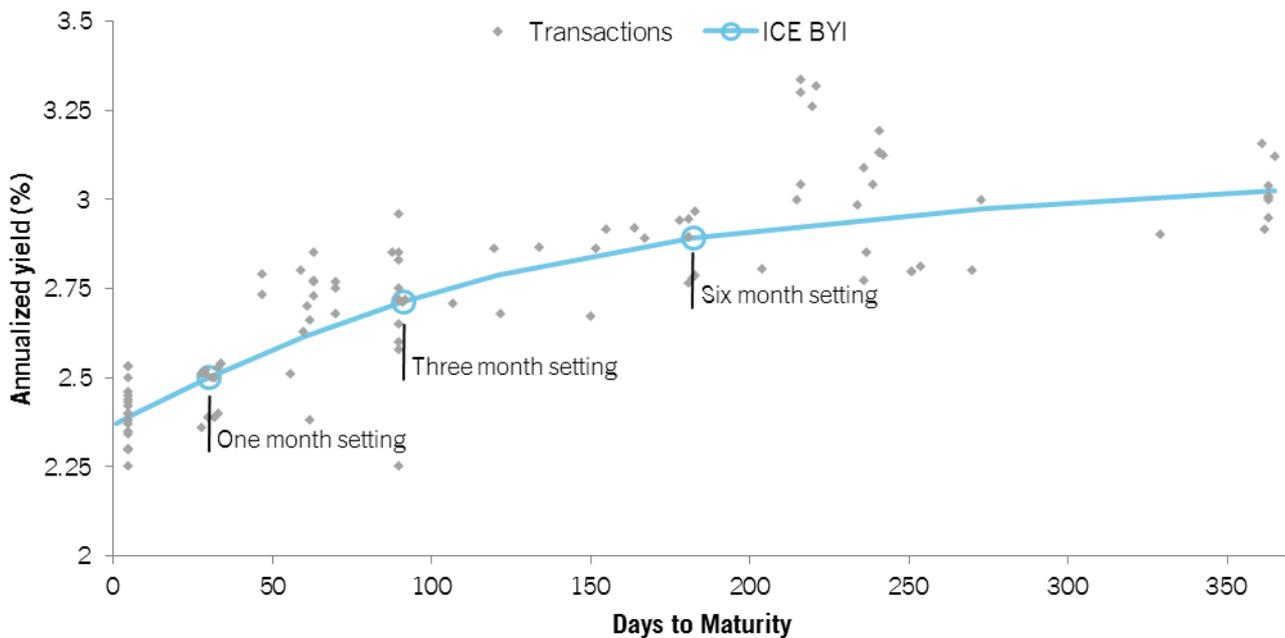


Figure 2: Curve-fitting and deriving term settings for January 16, 2019

USD ICE Bank Yield Index for 16-Jan-2019





IBA proposes to publish each of the one-month, three-month and six-month settings for the Index daily, during the morning New York time on the business day following the determination of the yield curve¹⁶.

The updated results of testing the preliminary Index methodology from January 2018 to the end of March 2019 are set out in the *Updated Testing Results* section and on IBA's [website](#).

¹⁶ i.e. the business day following the day on which the current input window (running from 11:00am (London time) / 6:00am (New York time) on the previous calculation day through to 11:00am (London time) / 6:00am (New York time) on the current calculation day) ends and the yield-curve is calculated. e.g. Following the end of the input window on April 3, 2019 at 11:00am (London time) / 6:00am (New York time), IBA will determine a yield curve in respect of April 3, 2019, in accordance with the Index methodology, from which term settings are obtained and published on April 4, 2019



Feedback on the Index

Main areas of Feedback

Following the publication of the [U.S. Dollar ICE Bank Yield Index white paper](#) on January 24, 2019, IBA has received responses from a variety of market participants. The feedback has generally focused on the following aspects of the Index:

- the criteria for identifying the eligible primary market funding and secondary market bond transactions used to construct the daily yield curves, and the associated transaction volumes;
- weightings of primary market funding transaction data compared with secondary market bond transaction data in the Index methodology;
- the methodology used to generate the daily yield curves from which the term settings are obtained; and
- contingencies in the event that insufficient input data points are available in order to generate one-month, three-month and six-month settings based upon the Index methodology.

IBA is providing further detail in relation to these points below.

Input Data Selection and Associated Transaction Volumes

As noted in the previous section, IBA currently uses two types of U.S. dollar-denominated transactional input data in order to calculate the U.S. Dollar ICE Bank Yield Index: primary market funding transactions and secondary market bond transactions.

IBA has chosen to reference data points relating to these obligations as they represent where investors have made short-term, wholesale, U.S. dollar investments on a senior, unsecured and uninsured basis in large, internationally active banks. In addition, the variety of the data points facilitates the construction of a robust yield curve over a time horizon of up to one year on a daily basis.

Primary Market Funding Transaction Data

The wholesale, primary funding transaction data are provided daily by 13 of the 16 U.S. dollar LIBOR panel banks. These transactions form part of the banks' daily evidence transactions that are supplied to IBA in connection with the LIBOR submission process. These transactions are categorized by the panel banks with reference to the eligibility criteria specified in the LIBOR Waterfall submission methodology, as described in the [ICE LIBOR Output Statement](#) and the [ICE LIBOR Methodology](#) and indicated in Figure 3, below. Only transactions that satisfy the requirements and criteria for use in a U.S. dollar LIBOR panel bank's Level 1 or Level 2 Waterfall methodology submission are currently eligible for inclusion in the preliminary U.S. Dollar ICE Bank Yield Index calculation.

In particular, a minimum of two distinct funding transactions sourced from a minimum of two distinct counterparties, each with a size of at least USD 10m, is necessary for those transactions to be eligible for use in a panel bank's Level 1 or Level 2 submission for a given LIBOR tenor. The current application of these criteria limits the amount of funding transactions that are eligible for use in determining the Index under the preliminary methodology¹⁷.

¹⁷ See note on *Potential Adjustments to the Input Data Eligibility Criteria in order to Increase Transaction Volumes* below for further information and some potential alternative approaches to funding data eligibility



Figure 3: Preliminary Index Methodology - Funding Transaction Eligibility Criteria - Waterfall Methodology

Category	Criteria
Transaction provider	List of eligible providers of funding transaction data to be confirmed ¹⁸
Transaction currency	USD
Transaction size	≥USD 10m
Number of transactions	≥2 per transaction provider per LIBOR tenor
Transaction type	Unsecured term deposits, commercial paper (fixed rate and primary issuance), certificates of deposit (fixed rate and primary issuance)
Counterparty type	<ul style="list-style-type: none"> • Banks; • Central banks; • Governmental entities; • Multilateral development banks; • Non-bank financial institutions; • Sovereign wealth funds; • Supranationals; and • Corporations (for transaction maturities > 35 days).
Number of counterparties	≥2 per transaction provider per LIBOR tenor
Days to maturity of transaction	≥5 business days and ≤500 calendar days
Funding location	<ul style="list-style-type: none"> <li style="width: 50%;">• Canada; <li style="width: 50%;">• Singapore; <li style="width: 50%;">• USA; <li style="width: 50%;">• Japan; <li style="width: 50%;">• EU; <li style="width: 50%;">• Australia; <li style="width: 50%;">• EFTA; <li style="width: 50%;">• United Kingdom¹⁹;and <li style="width: 50%;">• Hong Kong; <li style="width: 50%;">• Cayman Islands.

Secondary Market Bond Transaction Data

The secondary market bond transaction data in respect of eligible bonds issued by bank operating companies in 30 large, internationally active banking groups are sourced daily from the Financial Industry Regulatory Authority's™ (FINRA™) Trade Reporting and Compliance Engine™ (TRACE™). IBA has established criteria to determine which bond issuances in respect of these banks and which associated transactions best represent the rate at which investors are willing to invest U.S. dollar unsecured funds and are consequently eligible for inclusion in the Index calculation methodology, as indicated in Figure 4, below.

¹⁸ 13 of the 16 U.S. dollar LIBOR panel banks have consented to IBA using their funding transaction data for the purposes of testing the Index

¹⁹ In the event the United Kingdom ceases to be a member state of the European Union



Figure 4: Preliminary Index Methodology - Bond Transaction Eligibility Criteria

Category	Criteria
Bond issuer	36 eligible issuer banks, in 30 banking groups listed in column 2 of Term Sheet Appendix B (Draft Term Sheet) in Appendix 1 of the U.S. Dollar ICE Bank Yield Index White Paper
Issuance currency	USD
Issuance size	≥USD 500m
Transaction size	≥USD 2m
Bond type	Fixed coupon bond No economic calls prior to 30 days before maturity
Coupon range	≥1 percent and ≤5 percent, subject to adjustment over time by the Index Administrator (with consultation) based upon the current interest rate environment
Calendar days to maturity of the bond at settlement of transaction	≥20 and ≤500

Transaction numbers, volumes and weighted average maturities

The number of transactions and the transaction volumes in respect of the input data that has been used to determine the Index over the course of the updated testing period is shown in Figure 5, below. On average, over the course of the testing period, 153 individual transactions are used each day to construct the yield curve from which the one-month, three-month and six-month settings are derived.

Figure 5: Numbers and Volumes of Input Transaction Data by Transaction Type

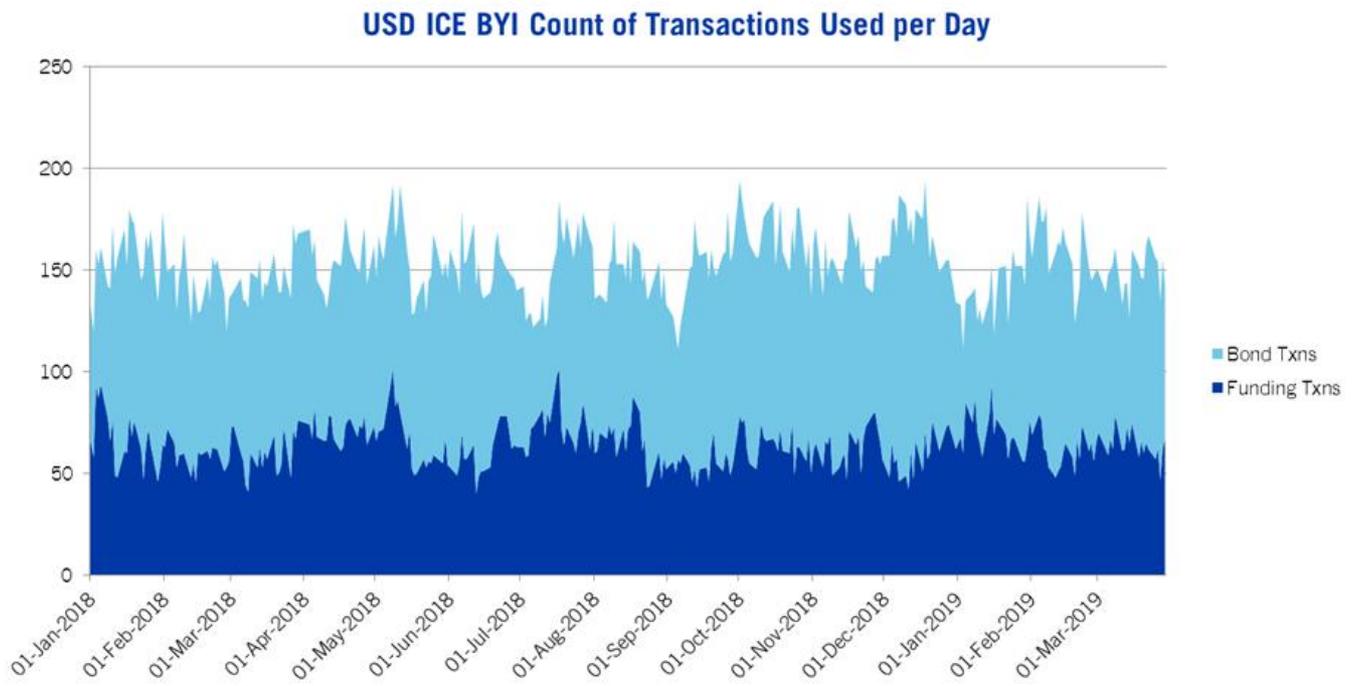
Transaction Type	Average Number of Transactions (per day)	Average Individual Transaction Volume	Average Aggregate Transaction Volume (per day)
Same-Day Funding Transactions	37	USD 100m	USD 3,687m
Funding Transactions from Previous Days	27	USD 81m	USD 2,165m
Total Funding Transactions	64	USD 92m	USD 5,852m
Same-Day Bond Transactions (USD 2 - 5m)	22	USD 3.2m	USD 69m
Bond Transactions from Previous Days (USD 2 - 5m)	38	USD 3.2m	USD 120m
Total Bond Transactions (USD2-5m)	60	USD 3.2m	USD 189m
Same-Day Bond Transactions (>USD 5m)	12	TBD ²⁰	TBD
Bond Transactions from Previous Days (>USD 5m)	18	TBD	TBD
Total Bond Transactions (>USD5m)	29	TBD	TBD
Total Transactions (All Types)	153	TBD	TBD

²⁰ Volume data for bond transactions with volumes greater than USD 5m is not available until 6 months following execution. Enhanced historical data published by FINRA™ for the first half of 2018, which includes TRACE™ transactions with volumes greater than USD 5m, gives an average volume per day of approximately USD14.1m in respect of eligible bond transaction used to determine the Index



The daily split between the primary market funding and secondary market bond transactions that are used to determine the Index over the course of the updated testing period is shown in Figure 6, below.

Figure 6: Number of Funding and Bond Transactions Used per Day



Weighted average maturity information in respect of all transactions that are used to determine the Index over the course of the updated testing period is shown in Figure 7, below. On average, the primary market funding transaction data tend to be concentrated at the front end of the yield curve and the secondary market bond transaction data tend to have longer maturities.

Figure 7: Volume-weighted Maturity of Input Transactions

Input Transaction Type	Volume-weighted Maturity of all Input Transactions (in days)
Funding Transactions	54
Bond Transactions (size USD 2 - 5m)	247
Bond Transactions (size >USD 5m)	250 ²¹

Potential Adjustments to the Input Data Eligibility Criteria in order to Increase Transaction Volumes

It would be possible to expand the eligible input data set for the Index by adjusting the primary market funding transaction data eligibility criteria, which (as noted above) currently reflects the LIBOR Waterfall methodology eligibility criteria for Level 1 and Level 2 submissions.

The current eligibility criteria specify that, for each LIBOR tenor, a bank must have executed a minimum of two distinct transactions with a minimum of two distinct counterparties, each with a size of at least USD 10m, in order for any of their transactions to be included in the Index calculation process for that tenor. Such criteria are deemed relevant for the LIBOR methodology because this involves each panel bank submitting one individual rate that is

²¹ Maturities for bond transactions with volumes greater than USD 5m are presented as simple averages because volume statistics for these bond transactions are not available until 6 months following execution



determined by reference to its eligible transactions (where available). These individual submissions (16 in total each day for each USD LIBOR setting) are collected by IBA and subject to trimming and averaging in order to generate each LIBOR setting.

In contrast, the U.S Dollar ICE Bank Yield Index preliminary methodology utilizes all eligible primary market funding and secondary market bond transaction data inputs (over 150 per day, on average), relating to a variety of large, internationally active banks, in the construction of a yield curve from which the settings are derived.

IBA could consider removing from the eligibility criteria the requirement for each individual submitting bank to have multiple transactions with multiple counterparties. If individual transactions with a size greater than USD 10m were to be permitted, this adjustment would result in an increase of 2695 transactions used in the construction of the Index over the course of the updated testing period, with an aggregate notional amount of USD 409.5 bn.

IBA is asking for feedback from both potential data providers (i.e. banks) and potential end users of the Index on this point in the *Updated Feedback Questions* section.

It would also be possible to increase the number of eligible funding transactions used to determine the Index by expanding the set of eligible submitting banks. In this regard, IBA is engaged in discussions with large banks that are active in the U.S. dollar wholesale, unsecured funding markets regarding their potential participation as transaction providers for the Index.

These potential adjustments to increase transaction volumes are in addition to the point already alluded to in the [U.S. Dollar ICE Bank Yield Index white paper](#) that the number of eligible funding transactions could also be increased by using more transactions from previous days. This could be achieved by increasing the target number of transactions within each maturity range or by always incorporating five previous days' transactions, so as to incorporate more credit-sensitive information into the Index.

Weightings of Funding Transaction Data Compared with Bond Transaction Data in the Index

In the preliminary Index methodology, IBA assigns a weighting of 100 percent to each primary market funding transaction and 50 percent to each secondary market bond transaction that is used to create the yield curve. These preliminary weightings were established in order to give greater influence in the construction of the Index to funding transactions, which tend to be of a significantly larger size than secondary market bond transactions, and so lead to a more representative Index.

Given the difference in the average size of primary market funding transactions, secondary market bond transactions with volumes between USD 2m and USD 5m and secondary market bond transactions with volumes over USD 5m²² (see Figure 4, above), IBA is considering incorporating a greater range of weightings of the types of input data used in the construction of the Index to better reflect these variations.

One potential approach is to create a three-tiered weighting system for the different types of inputs. For example, IBA could assign a weighting of 100 percent for funding transactions, 25 percent for bond transactions with volumes greater than USD 5m, and 10 percent for bond transactions with volumes between USD 2m and USD 5m. This would result in funding transactions having a greater influence in the construction of the Index on a daily basis, while still incorporating more sensitively-weighted information from transactions in the secondary bond market, in order to produce a more representative measure of the yields at which investors are willing to invest in large, internationally active banks.

IBA has also received feedback asking why the U.S. Dollar ICE Bank Yield Index is not produced on a volume-weighted average basis, in a similar manner to certain other short-term interest rate benchmarks. The rationale for not using a volume-weighted average calculation was driven by two primary considerations.

- First, individual banks obtain funding in the short-term, wholesale, unsecured markets on a periodic basis, based upon their funding needs at the time, with transaction sizes spanning several orders of magnitude. If the Index were to be based upon a volume-weighted average, then the daily settings could be unduly influenced by a bank completing a large (or a series of large) funding transactions on a given day and then potentially being

²² Volume data for bond transactions with volumes greater than USD 5m is not available until 6 months following execution



absent from the market for some time period thereafter, with such transaction(s) outweighing many more 'averagely' sized trades. By weighting each funding transaction equally and incorporating data (where required) from up to five previous days, IBA believes that the Index will be more representative of where an investor would be willing to invest, on average, in a broad set of large, internationally active banks having different characteristics.

- Secondly, given that volume data in respect of secondary market bond transactions with notional amounts greater than USD 5m that are used in the Index is unavailable until six months following execution, it is impossible to construct a true volume-weighted average calculation on a daily basis.

IBA is asking for feedback on its approach to weighting the input transaction data in the *Updated Feedback Questions* section.

The Methodology Used to Generate the Daily Yield Curves Underlying the Index

As described in the [U.S. Dollar ICE Bank Yield Index white paper](#), IBA is seeking feedback on the current proposed curve-fitting methodology and is considering alternative approaches:

- The current Index curve-fitting methodology uses a least squares best fit of all eligible data points to a third order polynomial. This approach assumes the yield curve is smooth and that it does not oscillate (i.e. move up and down repeatedly). As a result, where the distribution of the weighted and adjusted transaction yields is uneven (as it will tend to be given marginal differences in yields between different banks and different bonds and given the tendency of bond maturities to cluster around standard maturity dates), this methodology will operate to smooth out the data points into a continuous curve with a limited number of turning points. However, extreme outlier transactions have the potential to distort the whole curve.
- Another common curve-fitting approach is to use a regression based on localized splines, whereby separate polynomial curves are blended together. Using this approach, unevenly distributed or outlier data points will only affect the immediately surrounding section of the curve. This also allows the curve to adopt irregular shapes, potentially with multiple peaks and troughs. Spline-based curve-fitting can be tuned with more or less localization (i.e. constructed from a greater or lesser number of curve sections).
- In either a simple polynomial or a spline-based regression, outlier data points can potentially distort either part or the whole of the curve. A simple outlier exclusion approach, based on rejecting points located very far from an initial curve calculation, can potentially help to reduce their impact. However, any outlier exclusion approach relies on setting an appropriate sensitivity range (with the intention being to exclude only unrepresentative points markedly different in value from an initially calculated curve), so that the final curve does not deviate too far from the available market information and result in an unrepresentative index.
- A "robust" regression methodology can also be used to address outlier data points. This approach uses multiple iterations to find a best-fit curve, with data points nearer to the curve given the greatest weight to minimize the influence of relative outliers.

IBA's goal is to build an Index that can measure the yields at which investors are willing to invest U.S. dollar funds in large, internationally active banks on a wholesale, unsecured basis by incorporating as many representative and eligible data points as possible into the construction of the yield curve. The preliminary selection of a third order polynomial curve reflects the expectation that a curve constructed from a wide range of data points, which is designed to be credit sensitive in nature, will be the best indication of consensus yields. It also reflects the assumption that localized variations in the curve, resulting from clustering or unevenly distributed inputs, should not result in considerable distortion.

However, IBA recognizes that this approach is potentially sensitive to outliers (e.g. erroneous reported yields or transactions that are unrepresentative for some reason), and so it is likely that some adjustment will be needed to the model in order to minimize their effects.

Some feedback has suggested that a more localized fit, such as a spline-based regression, would more accurately reflect the data points across the yield curve and would also reduce the likelihood of outliers in any maturity range distorting the rates in other parts of the curve.



Another suggestion has been to convert the curve-fitting stage of the Index methodology into a process for generating a pure credit spread curve (i.e. the spreads at which banks are borrowing relative to a “risk free” rate). Using this approach, each transaction input data point would be converted to reflect the spread of the relevant transaction yield over a notional “risk free” rate curve (e.g. an implied term SOFR²³ curve). These resulting converted “spread” inputs could then be used to generate a fitted-curve representing borrowing spreads only, which could be added back to the notional “risk free” rate curve (e.g. the implied term SOFR curve at a certain point in time) in order to produce a composite curve and the associated Index settings.

IBA is asking for further feedback on its curve-fitting methodology and how to handle outlier data in the *Updated Feedback Questions* section.

Contingencies in the Event that Insufficient Input Data Points are Available in order to Generate One-month, Three-month and Six-month Settings Based upon the Index Methodology

IBA has received feedback asking whether and 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 using the Index methodology, as might be the case during a period of market illiquidity.

IBA’s proposed approach is to follow a contingency policy, which involves publishing the settings that were last determined based upon transaction input data using the applicable Index methodology, adjusted for movements in “risk free” rates (e.g. OIS, U.S. Treasury yields or implied term SOFR rates, if available). An example of how this would work is detailed in Figure 8, below.

Figure 8: Contingency Rate Calculation

Date	USD 3M IBYI	3M Risk Free Rate	Contingency 3M IBYI
1 September 20XX	(A) 3.00 %	(X) 2.00%	N/A
2 September 20XX	Insufficient data	(Y) 1.95%	$(A+[Y-X]) = \mathbf{2.95\%}$

This procedure could allow for the continued publication of the Index during periods of market illiquidity. These “contingency” settings would incorporate *both* the most recently available eligible credit sensitive transaction data (i.e. the most recent Index setting derived from the relevant transaction data inputs using the Index methodology, as opposed to the contingency policy) and “risk free” rates data, in order to ensure the contingency rates are representative of, and responsive to, market conditions at the time. The Index would resume publication in accordance with the usual methodology as soon as enough primary market funding and/or secondary market bond transaction data points were available.

It should be noted that the incorporation of both primary market funding and secondary market bond transaction data into the Index determination process should reduce incidences where this contingency approach is needed when compared with an index comprised of solely funding or bond transaction data. There have been no days within the test period to date on which a contingency rate would have needed to be published based on the preliminary Index methodology²⁴.

IBA is asking for feedback on its approach to contingency publications in the *Updated Feedback Questions* section.

²³ Secured Overnight Financing Rate published by the Federal Reserve Bank of New York

²⁴ Please note that, due to the period during which transaction data is available, IBA is unable to assess how the preliminary Index methodology would have performed during the period of the financial crisis and whether a contingency rate might have been required

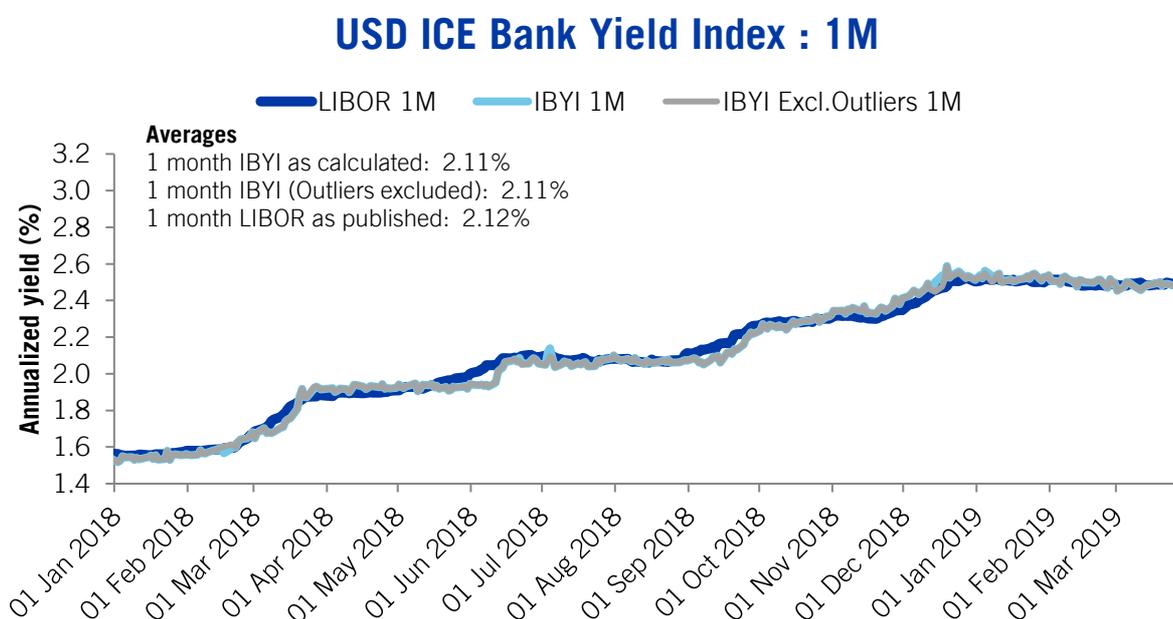


Updated Testing Results

IBA has performed test calculations for the U.S. Dollar ICE Bank Yield Index during the period from January 1, 2018 to March 31, 2019 using the preliminary Index methodology (as described in the section headed *Background, Rationale and Methodology*²⁵) in order to generate daily one-month, three-month and six-month settings²⁶. IBA has also generated Index settings for this period using the preliminary Index methodology adjusted so that outlier data points are excluded from the curve-fitting process based on a ± 100 bp sensitivity range.

Line charts showing the one-month, three-month and six-month settings for the U.S. Dollar ICE Bank Yield Index during the entire updated test period are shown in Figures 9, 10 and 11 below, together with these settings applying the ± 100 bp outlier sensitivity range and the corresponding U.S. Dollar LIBOR settings for the same time period²⁷.

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



²⁵ The methodology is described more fully in the [U.S. Dollar ICE Bank Yield Index white paper](#)

²⁶ The curve-fitting process in the preliminary Index methodology used to calculate the test results does not exclude or otherwise seek to adjust for any "outlier" data points

²⁷ 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: 3M

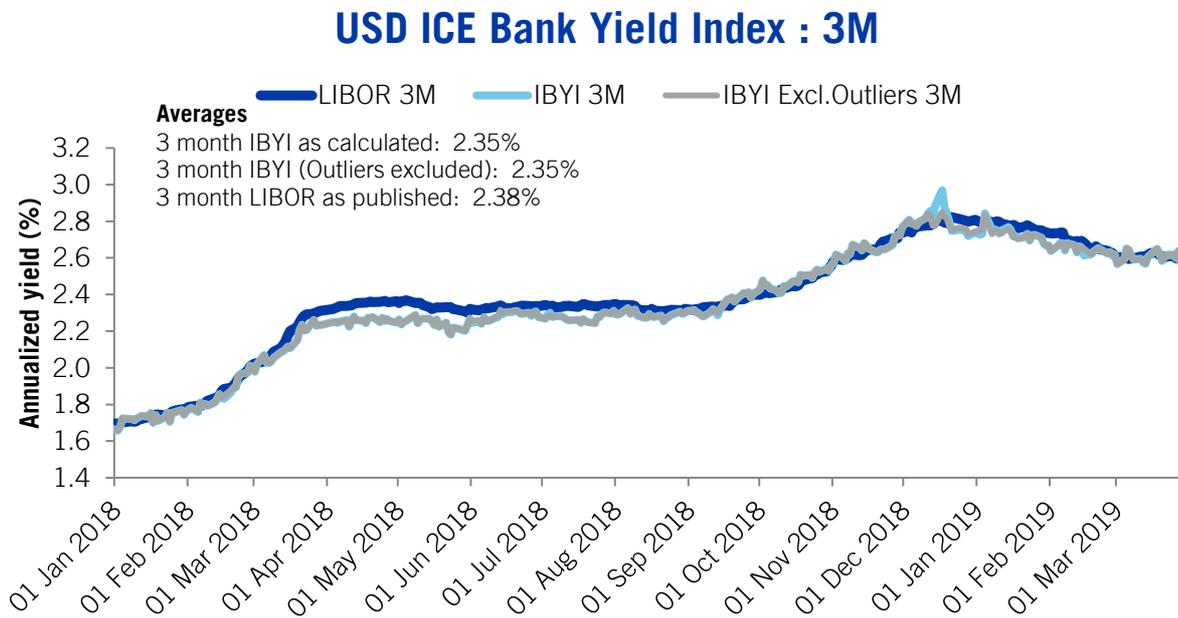
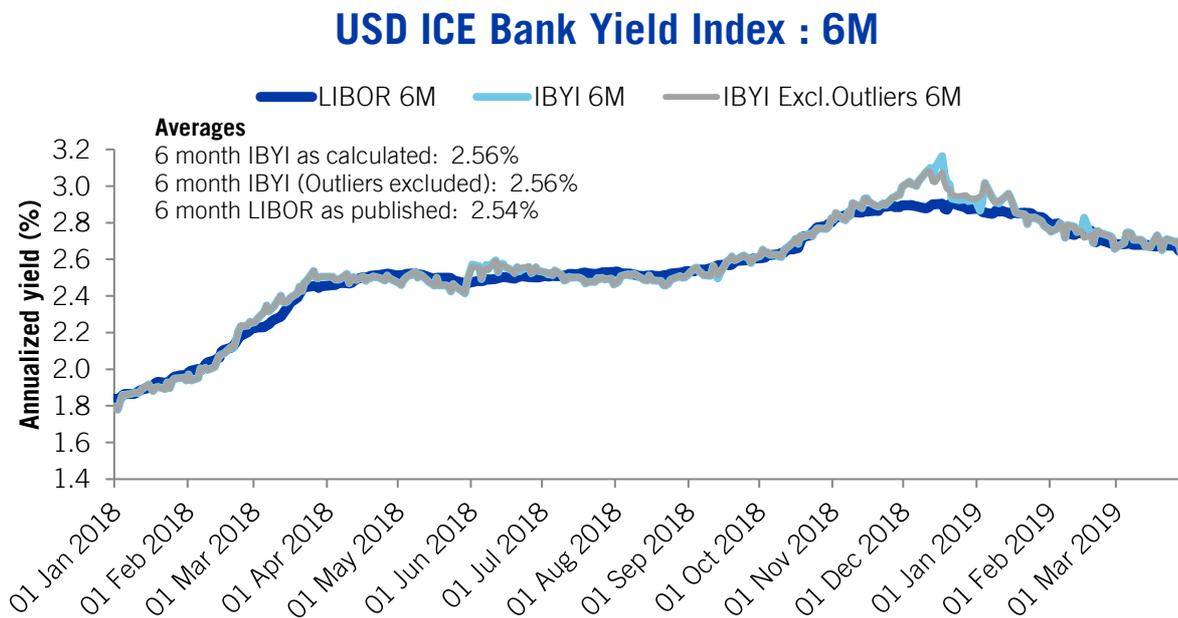


Figure 11: U.S. Dollar ICE Bank Yield Index: 6M



During the testing period, the Index was based on an average of 153 transaction inputs per day.



Updated Feedback Questions

IBA is extending the period in respect of which it is seeking feedback on the U.S. Dollar ICE Bank Yield Index to May 31, 2019, in order to give market participants more time to consider and respond in respect of the preliminary Index methodology, the additional points covered in this update and the updated test results.

Please see below the specific questions in respect of which IBA is requesting feedback from market participants and stakeholders, based on the feedback questions set out in the [U.S. Dollar ICE Bank Yield Index white paper](#).

Please refer to Appendix 1 (*Draft Term Sheet*) of the [U.S. Dollar ICE Bank Yield Index white paper](#) for further details on the Index methodology, including input data sources, eligibility criteria and weightings/adjustments.

Please see Appendix 2 (*Curve-fitting Methodology*) of the [U.S. Dollar ICE Bank Yield Index white paper](#) for further details on the curve-fitting methodology and some potential alternative approaches.

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?
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?
3.
 - 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?
 - 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?
 - 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?²⁸.

See below an example of an extreme outlier transaction at the short-end of the yield curve during a less liquid market period noticeably influencing the curve-fitting process on July 3, 2018 (Figure A) and resulting in a visible spike in the one-month rate chart over both July 3 and July 4, 2018 (Figure B). Figure B also shows the effect on the rate of applying a robust regression model and a +/- 100bps sensitivity.

²⁸ See note on *Weightings of Funding Transaction Data Compared with Bond Transaction Data in the Index* above for further information



Figure A: U.S. Dollar ICE Bank Yield Index: July 3, 2018

USD ICE Bank Yield Index for 03-Jul-2018

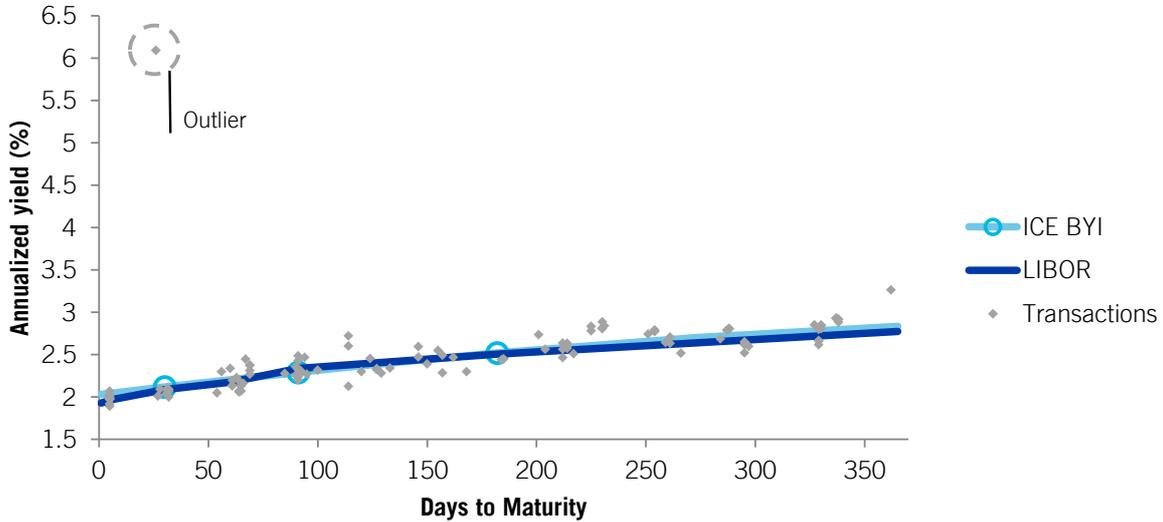
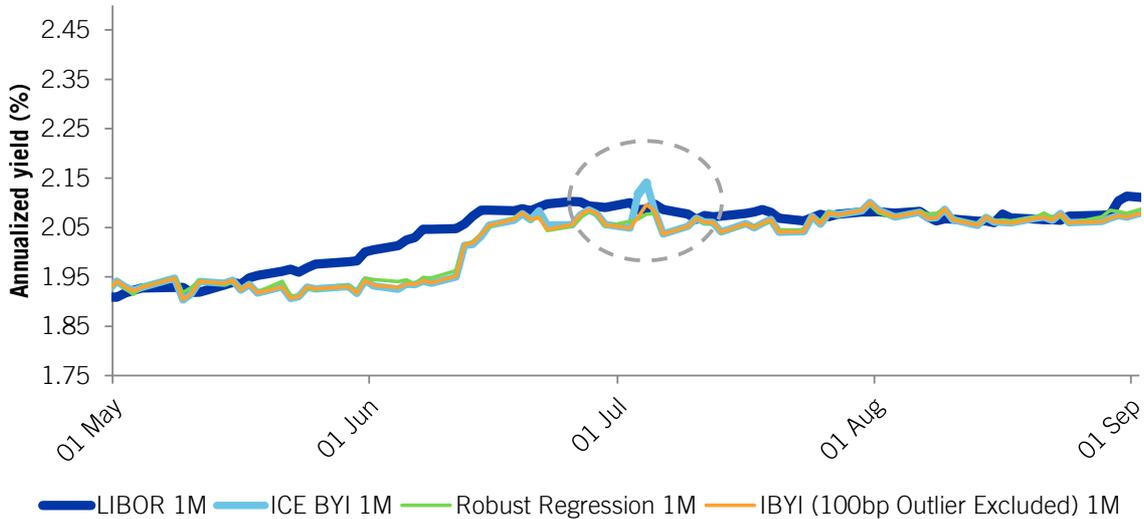


Figure B: U.S. Dollar ICE Bank Yield Index: 1M

USD ICE Bank Yield Index : 1M



See below a further example of outlier transactions at the middle of the yield curve during a period of market volatility noticeably influencing the curve-fitting process during December 2018, with December 17, 2018 used as an example date (Figure C). This was a factor resulting in a visible spike in the three-month rate chart during mid-December 2018 (Figure D). Figure D also shows the effect on the rate of applying a robust regression model and a +/- 100bps sensitivity.²⁹

²⁹ The charts in Figures A to D are shown together with the corresponding U.S. Dollar LIBOR settings/yield curves. 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 C: U.S. Dollar ICE Bank Yield Index: December 17, 2018

USD ICE Bank Yield Index for 17-Dec-2018

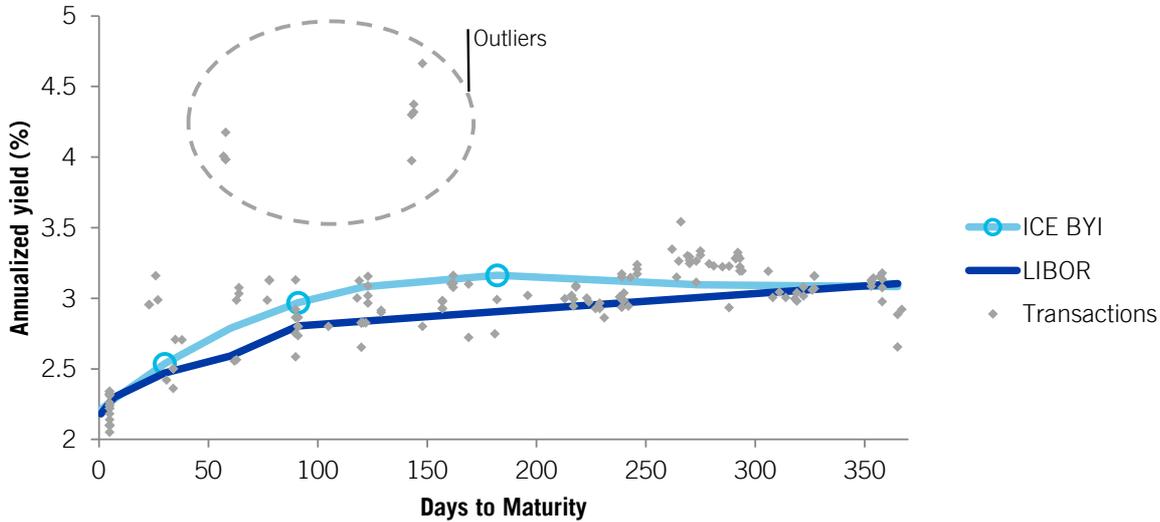
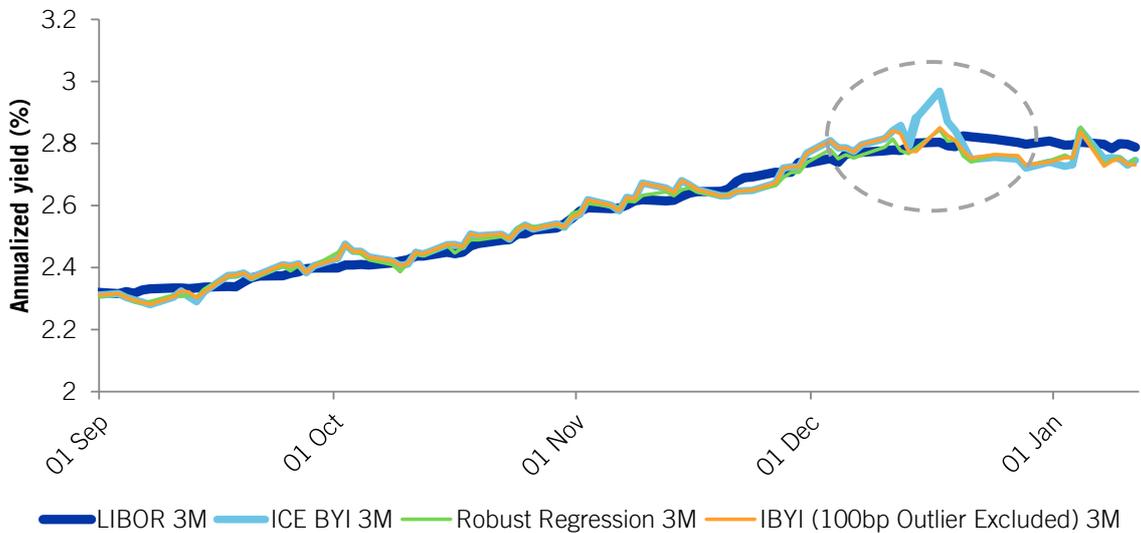


Figure D: U.S. Dollar ICE Bank Yield Index: 3M

USD ICE Bank Yield Index : 3M



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 increase³⁰.
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? Note that the preliminary methodology may utilise transactions in respect of *up to* five previous calculation days in order to achieve *at least* the target. If this process results in

³⁰ See note on *Potential Adjustments to the Input Data Eligibility Criteria in order to Increase Transaction Volumes* above for further information



ten or more eligible transactions for a given maturity range, then no additional previous days' transactions will be utilised but all such eligible transactions will be utilised.

- 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?
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)³¹ or no weighting be more appropriate?
 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?
 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?
 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. 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)?
 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?³²; and
 - 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.

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.³³
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

³¹ See note on *Weightings of Funding Transaction Data Compared with Bond Transaction Data in the Index above* for further information

³² See note on *Potential Adjustments to the Input Data Eligibility Criteria in order to Increase Transaction Volumes above* for further information

³³ See note on *Contingencies in the Event that Insufficient Input Data Points are Available in order to Generate One-month, Three-month and Six-month Settings Based upon the Index Methodology above* for further information



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).

14. Should any other sources of/types of data be considered for inclusion in the Index?
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?
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?
17. Please provide any other feedback you have on the U.S. Dollar ICE Bank Yield Index or its methodology.
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.



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