ICE BENCHMARK ADMINISTRATION

ROADMAP

FOR

ICE LIBOR

18th March 2016

Contents

----

1. EXECUTIVE SUMMARY

1.1 Introduction

LIBOR has been evolving since the Wheatley Review[1] in September 2012 and will continue to evolve to reflect the changes in the wholesale funding markets, banks' particular funding needs and practices, and the growing body of regulation.

As the benchmark administrator for ICE LIBOR ("LIBOR"), ICE Benchmark Administration ("IBA") has conducted extensive consultation over the past 18 months and has published two position papers and associated Feedback Statements[2] on proposals for the evolution of LIBOR. The first position paper was published in October 2014 and the second position paper in July 2015. In excess of 200 stakeholders participated in this consultation process and in roundtable meetings hosted by the following: the Bank of England; the Bank of Japan; the Banque de France; the Board of Governors of the Federal Reserve System and the Federal Reserve Bank of New York; and the Swiss National Bank.

This paper sets out IBA's Roadmap based on feedback to the position papers, as well as discussions with stakeholders at roundtable meetings across the globe.

The measures in this Roadmap are designed to deliver a seamless transition to an even more robust rate which will make LIBOR more sustainable for the long term.

In order to achieve those objectives:

- IBA will implement a uniform submission methodology for LIBOR panel banks based on parameters defined by IBA and the LIBOR Oversight Committee
- IBA will publish a single, clear, comprehensive and robust LIBOR definition
- Submissions will be non-subjective and fully transaction-based wherever feasible.

The standardising and updating measures set out in this Roadmap will be implemented progressively during 2016.

A comment made unanimously in the consultation feedback is that it is extremely important to users that LIBOR is published every day, which IBA will continue to do.

[1] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191762/wheatley_review_libor_finalreport_280912.pdf
[2] These are available at:
www.theice.com/publicdocs/ICE_LIBOR_Position_Paper.pdf
www.theice.com/publicdocs/futures/IBA_LIBOR_Feedback_Evolution_Statement.pdf
www.theice.com/publicdocs/ICE_LIBOR_Second_Position_Paper.pdf
www.theice.com/publicdocs/futures/IBA_LIBOR_Feedback_Evolution_Statement_20151214.pdf

In order to anchor LIBOR to the greatest extent possible in transactions, as well as reflect changes in banks' funding models, IBA has designed a waterfall of submission methodologies to ensure that LIBOR panel banks use funding transactions where available. In addition, the waterfall ensures that panel banks always make a submission regardless of activity levels on a particular day.

The waterfall of methodologies is as follows:

- Level 1: The Volume Weighted Average Price (VWAP) of eligible transactions
- Level 2: Submissions derived from transactions (including adjusted and historical transactions, interpolation and parallel shift), and
- Level 3: Expert judgement, appropriately framed.

In accordance with its regulatory obligations to maintain the integrity of the market and the continuity of the benchmark, IBA has been mindful of the potential impact of this Roadmap. Legal advice indicates that implementation of the roadmap is unlikely to give rise to issues of legal continuity.

An important and recurring theme in the consultation feedback was the view that panel banks should only provide trade data to IBA, who would then use the trade data to calculate and publish LIBOR rates each day. This was seen as likely to reduce the need for subjective decisions and expert judgement by the panel banks.

The measures outlined in this Roadmap provide the foundation for IBA to build the systems and algorithms required to automate the collection of trade data from LIBOR panel banks and to remove banks' expert judgement completely from the LIBOR submission process.

IBA is looking into the feasibility of further evolving LIBOR to a centralised calculation using a robust algorithm to calculate LIBOR in diverse market circumstances. IBA anticipates completing this feasibility study by end of Q2 2016.

IBA believes that such a step could also increase the number of banks which submit data and further enhance the robustness of the benchmark.

1.2 Brief History of LIBOR

LIBOR as a contractually defined term was developed in May 1970 to facilitate loan transactions. Its development was further driven by the growth in new financial instruments which also required standardised interest rate benchmarks. Such a standardised rate was developed in the 1980s and was administered by the British Bankers' Association ("BBA") through BBA LIBOR Limited and published as BBA LIBOR from January 1986 until January 2014.

LIBOR changed over the years, both in terms of currencies published and the banks making up each currency panel. In addition, the British Bankers' Association changed the LIBOR question in 1998 from a rate at which the submitter believed a prime bank would be offered deposits in the market to a rate at which the panel bank itself could borrow funds.

The submission process was at that time largely unsupervised and conflicts of interest were not addressed. These structural failings led to significant and highly publicised fines levied globally since 2012 on a number of panel banks for inappropriate conduct with regard to the benchmark.

Submission to LIBOR fell outside the regulatory perimeter. However, in September 2012, the Wheatley Review of LIBOR set out a ten-point plan for its reform. The recommendations from the review included: statutory regulation of the administration of, and submission to, LIBOR; an Approved Persons regime; and both civil and criminal enforcement. These measures came into force on 1 April 2013.

The Wheatley Review also recommended transferring responsibility for LIBOR administration from the BBA to a new administrator. IBA became the new administrator in February 2014.

1.3 LIBOR Today

LIBOR is referenced by an estimated US $350 trillion of outstanding contracts in maturities ranging from overnight to more than 30 years.

It is the primary benchmark for short term interest rates globally. It provides the average rate at which a LIBOR panel bank could obtain unsecured funding for a given period in a given currency.

LIBOR is written into standard derivative and loan documentation, such as the standard terms of the International Swaps and Derivatives Association ("ISDA"), the Loan Market Association ("LMA") and the Loan Syndication and Trading Association ("LSTA") and is used for a wide range of retail products such as mortgages and student loans.

LIBOR is also used as a barometer to measure the health of the banking system and as a gauge of market expectation for future Central Bank interest rates. It is the basis for settlement of interest rate contracts on many of the world's major futures and options exchanges.

LIBOR is produced by IBA on London business days for 5 currencies with 7 maturities quoted for each - ranging from overnight to 12 months, producing 35 rates each business day.

IBA maintains a reference panel of between 11 and 18 banks for each currency calculated; each bank submits the rates at which it could obtain unsecured funding in each maturity for the relevant currency. IBA calculates LIBOR rates using a trimmed arithmetic mean, by excluding the highest and lowest quartile of submissions.[3]

The misconduct affecting LIBOR in the past is well documented. Since then, significant regulatory and governance measures have been put in place to restore the integrity of the benchmark:

- IBA is regulated by the FCA and is subject to Chapter 8 of the FCA's Market Conduct sourcebook ("MAR") rules specifically related to the administration of the eight most important benchmarks in the UK

[3] For further information please visit www.theice.com/iba/libor, Calculating ICE LIBOR

- Separately capitalized from its parent company, IBA has an independent governance structure including a board with a majority of Independent Non-Executive Directors[4]

- LIBOR panel banks send all of the related funding trades to IBA every day together with other evidence to support their LIBOR submissions for that day

- LIBOR panel banks are also regulated by the FCA and must have designated senior managers ("CF40s") who have personal liability. The upcoming implementation by the banks of the FCA's new Senior Managers Regime (SMR) will further strengthen the accountability of senior managers in respect of benchmarks

- LIBOR panel banks are required to have annual external audits of their LIBOR submission processes, governance and controls

- LIBOR panel banks have implemented robust governance processes for their LIBOR submissions and their controls have been reviewed by the FCA

- Attempted manipulation of LIBOR would now have to involve a significant number of people within one or more banks bypassing a wide range of control mechanisms

- Manipulation or attempted manipulation of LIBOR is now a criminal offence in the UK

In order to improve the LIBOR benchmark, IBA has made significant investment in new technology, methodologies and oversight:

- IBA has developed purpose-built surveillance tools and systems, as well as a dedicated team of analysts who examine banks' trading activity and related evidence every day running millions of pre- and post-publication statistical calculations and analyses on LIBOR submissions

- The submission process which had been unchanged for many years is now run on modern technology with a redesigned and automated process, providing real time validation checks on the submissions to prevent errors before the rate is calculated

- All redistributors receive LIBOR data at the same time from the same place, and

- The LIBOR Oversight Committee includes representatives of users, submitters and infrastructure providers. The committee also has Observers from the Board of Governors of the Federal Reserve System, the Swiss National Bank and the Bank of England. In addition, two independent directors of IBA serve on the committee.

[4] Please see https://www.theice.com/iba/board-of-directors.

2. EVOLUTION OF LIBOR

In line with the strategic direction set by the Financial Stability Board ("FSB") and other official sector bodies, IBA is focused on evolving LIBOR to meet the following objectives:

- Base LIBOR in transactions to the greatest extent possible
- Publish a single, clear, comprehensive and robust LIBOR definition
- Implement a construct for ensuring the rate can adapt to changing market conditions with appropriate consideration for the interests of all stakeholders, and
- Evolve LIBOR through a seamless transition.

IBA has consulted widely on the evolution of LIBOR and has published two position papers and associated Feedback Statements[5] on proposals for the evolution of LIBOR. The Second Position Paper was distributed to around 1,000 recipients and about 200 stakeholders were represented at bilateral meetings, roundtables and other forums. This Roadmap has considered all input received during the consultation.

IBA is mindful of the changes (e.g. expanding the universe of inputs) that panel banks have already implemented in response to the Wheatley Review and the subsequent legislative and regulatory developments. Some aspects of LIBOR needed to be updated to reflect these changes.

The consultation endorsed a waterfall of methodologies which IBA will be adopting as follows:

Waterfall Level	Waterfall type	Waterfall features
1	Transactions	• Time-weighted and Volume Weighted Average Price ("VWAP") of the bank's eligible transactions
2	Transaction-derived data	• VWAP of adjusted historical transactions • Interpolation • Parallel Shift
3	Expert Judgement	• Using a documented methodology for basing submissions on transactions in related markets, committed quotes, indicative quotes and other market observations

[5] These are available at:
www.theice.com/publicdocs/ICE_LIBOR_Position_Paper.pdf
www.theice.com/publicdocs/futures/IBA_LIBOR_Feedback_Evolution_Statement.pdf
www.theice.com/publicdocs/ICE_LIBOR_Second_Position_Paper.pdf
www.theice.com/publicdocs/futures/IBA_LIBOR_Feedback_Evolution_Statement_20151214.pdf

The LIBOR Oversight Committee will carefully oversee LIBOR's evolutionary progress.

2.1 Counterparty types

LIBOR was initially created to be a gauge of unsecured funding for banks which was, to a very great extent, driven by interbank activity prior to the financial crisis.

The activity in that market has decreased markedly and wholesale deposits negotiated with other counterparties are playing an increasingly important role in bank funding. This change of behaviour led IBA to conclude that unsecured loans by corporates (i.e. non-financial corporations, termed in the Feedback Statement and in this Roadmap as "corporations") in addition to financial institutions should be eligible as counterparties to transactions that inform LIBOR submissions - where the bank is the borrower and the corporation is the lender.

The feedback to the consultation confirmed that, consistent with the original purpose of LIBOR and to reflect the changes in bank funding in recent years, a broader set of wholesale funding entities should be regarded as eligible counterparty types.

In calculating their LIBOR submissions, panel banks will use transactions where they receive funding from the following wholesale market counterparties:

- Banks
- Central Banks
- Corporations as counterparties to a bank's funding transactions but only for maturities greater than 35 calendar days
- Government entities (including local /quasi-governmental organisations)
- Multilateral Development Banks
- Non-Bank Financial Institutions, including Money Market Managers and Insurers
- Sovereign Wealth Funds, and
- Supranational Corporations.

Including trades with corporations will increase the quantity of transaction data available to set the rate thus also helping LIBOR to meet the strategic direction set by the FSB and other official sector bodies for anchoring LIBOR in transactions. IBA estimates that the inclusion of such trades could increase the transaction volume by up to 15%, depending on the relevant currency and tenor.

IBA will not include transactions with corporations with a maturity of 35 days of fewer, as some short-term corporate deposits can be motivated by a need for a 'home' for the money and therefore the rate can be a relatively minor consideration.

Transactions will be used with no premium or discount to adjust the transacted prices.

2.2 Funding locations

LIBOR is a global rate and transactions from an expanded list of funding centres will be used. IBA will maintain an Approved List of Funding Locations.

The Approved List of Funding Locations will be owned by the LIBOR Oversight Committee and will be based on the major centres in Canada, USA, EU, EFTA, Hong Kong, Singapore, Japan and Australia. This list can be adjusted as necessary according to a set of predefined criteria:

- a material level of transactions that will inform transaction-based calculations
- a satisfactory regulatory oversight regime for wholesale funding transactions
- an absence of capital controls, sanctions or other regulatory steps that would influence rates, and
- The location is used by one or more bank(s) or a bank has requested to use the location.

Since each of the LIBOR panel banks has its own organisational and geographical profile, IBA will agree the appropriate locations with each bank bilaterally from the Approved List of Funding Locations, being mindful of the need to safeguard the representativeness of the transactions and their pricing

Once the locations are agreed, the panel bank must use those locations until a request to change is reviewed by the LIBOR Oversight Committee and approved by IBA.

2.3 Level 1 inputs

2.3.1 Transaction window and publication time

LIBOR is a rate as of 11.00 London time, which was seen as an important criterion for assuring the continuity of contracts referencing LIBOR. It is also clear that a longer data collection period to maximise the number of transactions and publication remaining at 11.45 is also important. To include as many transactions as possible within submissions, the collection window will be the period since the previous submission. Using transactions booked over a period of time is already accommodated in many banks' current methodologies.

As the period since the previous submission crosses two London trading days, the transactions from the previous day will be volume-weighted lower compared to weighting of transactions from the same day. This positively weights the transactions nearer the submission time in the VWAP calculation.

2.3.2 Product types

IBA is standardising the acceptable Level 1 (Transactions) as the VWAP of transactions in the following:

- Unsecured Deposits
- Commercial Paper ("CP") – fixed-rate primary issuances only, and

- Certificates of Deposit ("CD") - fixed-rate primary issuances only.

As stated in the Position Papers, panel banks already use a wide range of transactions to anchor their LIBOR submissions within the existing waterfall of methodologies in Box 4.B of the Wheatley Review.

2.3.3 Minimum transaction sizes

The FSB's desire for LIBOR to be transaction-based as far as possible means a more formulaic approach for banks and an appropriate trade size threshold needs to be set. This involves balancing, on the one hand, a threshold size that mitigates potential manipulation and/ or distortion of rates and, on the other hand, a threshold that does not unduly exclude transactions but reflects the wholesale market that LIBOR represents.

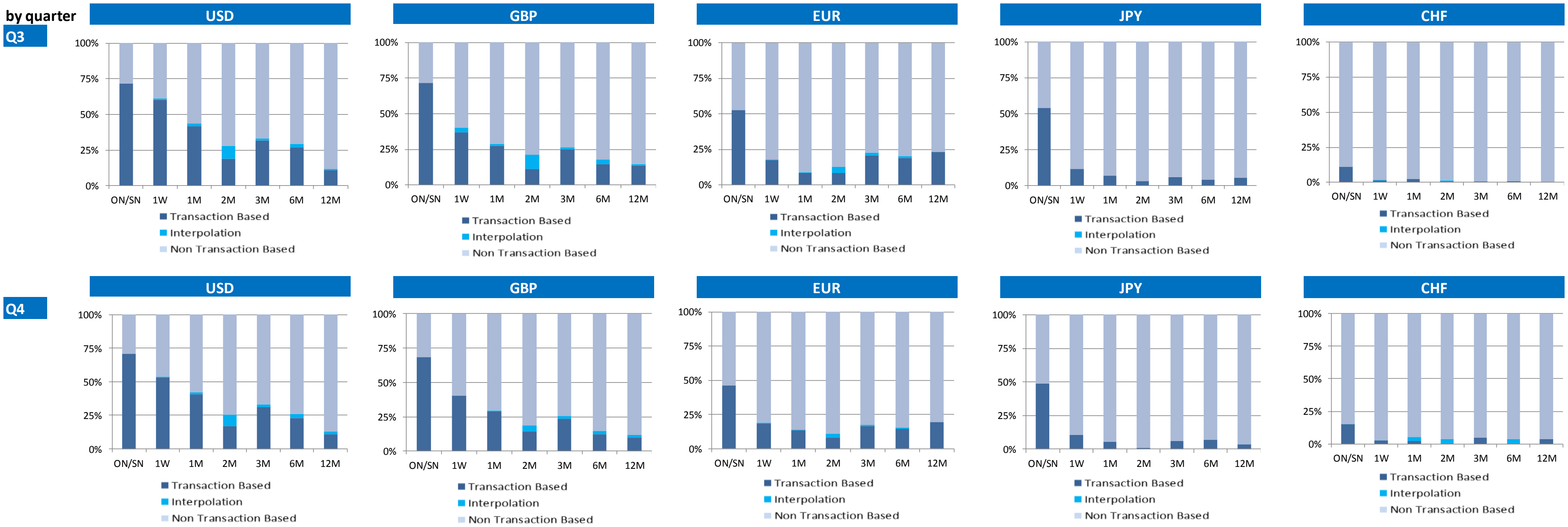
Following the consultation, IBA has set overall minimum thresholds of USD / EUR / GBP / CHF 10m (or JPY 1,000m) and two trades with different counterparties.

In the Second Position Paper, IBA included several charts showing for USD LIBOR an indication of possible thresholds and the effect they may have on the respective input ratios related to Level 1 (Transactions), Level 2 (Transaction-derived) and Level 3 (Expert Judgement) submissions.

Equivalent charts for all currencies for Q3 and Q4 2015 are shown below to indicate the respective ratios of transaction-based submissions, interpolation and expert judgement.

However, the charts are not necessarily representative of the future where standardised parameters will be utilised.

Charts illustrating percentage of submission types for all currency panels for Q3 and Q4 2015



Note: statistics are calculated from data submitted by panel banks in the currencies for which they are a LIBOR panel contributor

2.3.4 Tenor bucketing

Transactions with maturities falling between required submission tenors are important data points to incorporate in the formulation of LIBOR. For example, a 2.5 month transaction might naturally populate the 2 or 3 month category, or indeed both.

To ensure a consistent methodology and remove the requirement for judgement, the tenor bucketing matrix will be as follows to ensure a consistent methodology between banks:

Tenor	Business Days	
ON/SN	01	
1W	05	
Tenor	**Calendar Days (inc.)**	
1M	25	35
2M	50	70
3M	80	100
6M	150	210
12M	330	390

Trades which do not fall into any of the above tenor buckets could nevertheless be used for Level 2 (Transaction-derived) and in framing Expert Judgement for Level 3 inputs.

2.3.5 Month ends

Currently, in some currencies and tenors, higher volatility is observed over month / quarter / year ends.

IBA has narrowed the tenor bucketing, as above, to reduce the impact of month ends. For overnight and spot-next tenors, IBA will apply a more specific rule in order to reduce any distortion.

To achieve the most accurate rate on period ends, and at the same time minimize the use of expert judgement, IBA has narrowed the submission window for overnight and spot-next tenors to same day transactions on the first and last day of each month. This approach will also be taken for these two short tenors on the effective date of a policy rate change.

2.4 Level 2 inputs

2.4.1 Historical transactions

The use of historical transactions involves a bank taking its transactions from previous day(s) and adjusting them by the change of a correlated rate (e.g. OIS, futures, short-dated government bonds, Repos, Central Bank rates).

Taking into account the activity in the underlying market, the LIBOR Oversight Committee has set the maximum number of LIBOR submission days for which historical transactions can be used, as follows:

	USD	EUR	GBP	CHF	JPY
1M	3	3	3	5	5
2M	3	3	3	5	5
3M	3	3	3	10	10
6M	5	5	5	10	10
12M	10	10	10	15	15

Such numbers will be kept under close review by the Committee.

Level 2 historical trades will be weighted depending on their currency, tenor and proximity to the time of submission.

2.4.2 Interpolation

Where transactions are not available for a currency and tenor, or are below the minimum transaction size, linear interpolation and parallel shift techniques should be utilised to fill gaps in the curve.

The very short end of the curve (O/N, S/N and 1 Week) has different dynamics to the rest of the LIBOR curve. Regulatory obligations such as the Liquidity Coverage Ratio under which banks are required to hold sufficient high-quality liquid assets to cover their total net cash outflows over 30 days and credit and liquidity premiums have a different impact on those shorter tenors. In addition, the market conventions (same day, T+2 etc.) are usually specific to the overnight tenor. These tenors usually have the greatest number of transactions.

Interpolation will therefore be limited to determining the 2 Month, 3 Month and 6 Month tenors, using the transacted rates from adjacent tenors which may include rates calculated from historical trades and also trades in non-standard tenors.

2.4.3 Parallel shift

Where a tenor has no transactions and only one neighbouring tenor has a transaction-based rate, a bank can parallel shift rates based on the day-on-day change in value of the neighbouring tenor's rate.

As with interpolation, the very short end of the curve (O/N, S/N and 1 Week) has different dynamics to the rest of the LIBOR curve.

IBA has decided that parallel shift will be applicable for the 1 Month to 12 Month tenors, calculated by using the day-on-day basis point delta for a transaction based VWAP (which can include adjusted historical trades) from a single adjacent tenor.

2.5 Level 3 inputs

It was recognised in the consultation that Expert Judgement has to be used when a LIBOR panel bank has insufficient transactional data to support a Level 1 or Level 2 submission. It is important that Expert Judgement be framed in the following manner, being:

- Based on the panel bank's internally approved procedure and agreed by IBA
- Formulated using the inputs allowed by IBA, and
- Accompanied by full documentation of the rationale and with the supporting evidence provided to IBA.

The allowable inputs will be:

Parameters	Allowable inputs	Disallowed inputs
Funding Transactions	Transactions not eligible for use in Level 1 or Level 2	
	Adjusted Historical Transactions exceeding rolling date	
Related market instruments	Interest Rate Futures	
	FRAs	
	Interest Rate Swaps	
	FRNs and FRCDs	
	FX (forwards, swaps)	
	OIS curves	
	Repo	

Market observations	Observed third party transactions Broker quotes Observed third party levels	
Macro-economic factors	e.g. Policy rate changes	
Credit standing	A published and verifiable change in the credit standing of the bank	
Other	Other factors that can be evidenced and verified, if agreed with IBA	Any factors that cannot be evidenced and verified Any factors that might present the bank with a conflict of interest

IBA will publish a regular retrospective statement showing the ratio of respective inputs (i.e. transactions, transaction-derived data and Expert Judgement).

2.6 Allowance for exceptional market events

One of the fundamental objectives of IBA's enhancements to LIBOR is to anchor the rate in transactions to the greatest extent possible.

However, a mechanism is needed in order to protect the integrity of the rate in times of severe market dislocation.

It is important to strike a sensible balance between ensuring representativeness of the rate and minimising the occasions on which a VWAP of available transactions is altered.

Generally underlying markets are fairly resilient when unexpected events occur or when scheduled economic announcements have a different outcome to market expectations. However, there are occasions when an event occurs that creates exceptional volatility in financial markets and affects price discovery.

IBA will seek to determine a mechanism for allowing adjustments to submissions in circumstances in which an exceptional and unpredictable event has occurred triggering severe market dislocation. IBA's review of such events over recent time periods indicates that this would be an exceptionally rare circumstance. IBA will publish further details of any proposed mechanism before its adoption.

3. OTHER CONSIDERATIONS

3.1 Expanding panel sizes

Widening the currency panels would create a virtuous circle of more transactions, enhancing the market representation, making LIBOR ever more difficult to manipulate, reducing the regulatory and legal risk for panel banks and thus attracting more panel banks.

Expanded panels would have the following clear benefits:

- An increased number of available transactions would make the transition to a trade-driven benchmark more attainable and ensure that the rate is as representative of the underlying market as possible

- The lessened impact of any single submitter would further reduce both the opportunity and motive for manipulation

- There is a current unfairness in that 20 banks bear the cost, effort and risk of being submitters to LIBOR whilst a very large community of banks benefits from availability every day of the rate, and

- Increasing the panel sizes would reinforce the sustainability of the rate.

In streamlining the submission process and by being clear on expectations from panel banks, IBA believes that the risk in submitting to LIBOR has already been lessened.

3.2 Calculation methodology

LIBOR is currently calculated using a trimmed arithmetic mean. Once all submissions are received, they are ranked in descending order and then the highest and lowest quartiles of submissions are excluded to remove outliers from the final calculation. A mean is calculated from the remaining middle quartiles.

This trimming of the top and bottom quartiles allows for the exclusion of outliers from the final calculation.

There is a balance to be struck between, on the one hand, lower trimming which allows more submission values to be reflected in the calculated LIBOR value and, on the other hand, protection from outliers.

There was some support in the consultation for lowering the trimming to 12.5% to allow more submission values to be reflected in the calculated LIBOR value. However, IBA has decided to keep the matter under review whilst, for the time being, retaining the current protection from outliers through trimming the highest and lowest quartiles.

An equal weighting will be maintained for each bank's submission.

An important and recurring theme in the feedback was the view that panel banks should submit 'raw' trade data to IBA, who would then calculate and publish rates for the day. This was seen as likely to result in a much reduced need for subjectivity and the use of Expert Judgement. Further information on this topic can be found in Section 5 of this Roadmap.

3.3 Data embargo

Up until April 2013, panel banks' individual LIBOR submissions were published daily alongside the final LIBOR rate. Such publication was intended as a mechanism to promote transparency and public accountability for the accuracy of submissions.

However, this increased the benchmark's susceptibility to manipulation since panel banks could estimate the likely impact of their submission on the overall rate. Submissions were interpreted (often erroneously) as signals of a change in the creditworthiness of a submitter.

These considerations led the Wheatley Review to recommend publication of individual submissions after an embargo of at least three months.

IBA currently publishes a daily file containing the individual named submissions made three months prior to that day and, on the first business day of each month, a monthly file containing all of the submissions that became unembargoed in the previous month. This ensures that there is a delay of at least three calendar months before the submissions are published. In the first Position Paper, we invited comments from stakeholders on whether this process should remain the same going forward.

LIBOR panel banks have expressed concern not only that commercially sensitive data would become public but also that day-on-day volatility in LIBOR rates could lead to false inferences about a bank's financial stability and credit quality.

To address this concern and to maintain transparency as far as possible, IBA will publish individual submissions after three months' delay, as at present, but on a non-attributed basis. Individual submissions will continue to be available to IBA, the FCA and, as appropriate, the LIBOR Oversight Committee.

3.4 Tenor usage

In the Second Position Paper, IBA invited respondents to raise any other considerations that they thought should be included to further enhance the LIBOR reforms.

One suggestion was that IBA should consider the list of tenors as some are not actively used especially in certain currencies. With the first Position Paper, issued in October 2014, IBA initiated a review of the use of all currencies and tenors.

The feedback at that time, especially from corporations, was that all currencies and tenors are used regularly.

IBA will be engaging in a further consultation on the depth of usage of LIBOR currencies and tenors to assess whether further fall-backs are needed and/or whether discontinuation of some tenors may be appropriate.

4. DEFINITION OF LIBOR

Embedding LIBOR to the greatest extent possible in transactions provides the opportunity to review other aspects of the benchmark:

- The 'definition', insofar as one exists, and whether it should be updated in line with the changes in banks' funding activity

- Whether a change in the calculation of LIBOR would be desirable, and

- Whether the current embargo on publishing submissions remains appropriate.

Currently there is no single definition of LIBOR, rather different market participants refer to LIBOR based on varying combinations of:

- Its acronym LIBOR (from London Interbank Offered Rate)

- The question asked of submitters, referred to as the "Administrator's Question", which is currently **"***At what rate could you borrow funds, were you to do so by asking for and then accepting inter-bank offers in a reasonable market size just prior to 11 am?"*, and

- Market practice for bank unsecured funding activity.

Some contracts refer to LIBOR based simply on its location on a specific data distributor's screen, while others continue to refer to it as BBA LIBOR.

The BBA changed the LIBOR question in 1998 from a rate at which the submitter believed a prime bank would be offered deposits in the market to a rate at which the panel bank itself could borrow funds. This was the last occasion when the definition was re-examined and changed.

Whilst there were mixed views from the consultation as to whether the 'Administrator's Question' should fall away, there was general support for what IBA had termed an 'Output Statement'.

IBA has concluded that there should be an Output Statement as follows instead of the Administrator's Question'.

ICE LIBOR OUTPUT STATEMENT

"ICE LIBOR is the benchmark published under that name or as "LIBOR" and calculated by ICE Benchmark Administration Limited (IBA) on London business days.

It is a wholesale funding rate anchored in LIBOR panel banks' unsecured wholesale transactions to the greatest extent possible, with a waterfall to enable a rate to be published in all market circumstances:

Level 1:

A volume weighted average price (VWAP) of transactions in unsecured deposits and primary issuances of commercial paper and certificates of deposit since the previous submission, with a higher weighting for transactions booked closer to 11:00 London time.

Eligible counterparties are providers of wholesale unsecured funding including:

- banks
- central banks
- government entities
- multilateral development banks
- non-bank financial institutions
- sovereign wealth funds
- supranationals, and
- corporations as counterparties to a bank's funding transactions for maturities greater than 35 days.

Transactions in approved major funding centres are taken into account without price adjustment, subject to minimum transaction sizes and number of trades as specified by IBA.

Level 2:

Transaction-derived data, including time-weighted historical transactions adjusted for market movements, linear interpolation and parallel shift.

Level 3:

If the LIBOR panel bank has insufficient Level 1 and Level 2 transactions, it should submit the rate at which it could fund itself at 11:00 London time with reference to the unsecured wholesale funding market. In order to determine this rate the bank should follow its internally approved procedure agreed with IBA.

LIBOR is calculated as of 11.00 every London business day and normally published by IBA at 11.45 London time; it is a trimmed arithmetic mean that excludes the highest and lowest quartile of submissions. Each panel bank's submission carries an equal weight, subject to the trimming.

The panel banks' individual submissions are published by IBA after 3 months on a non-attributed basis.

Further details are published at www.theice.com/IBA.

IBA is authorised and regulated by the Financial Conduct Authority."

5. CENTRALISED DETERMINATION OF LIBOR

An important and recurring theme in the feedback was the view that panel banks should submit 'raw' trade data to IBA, who would then calculate and publish rates for the day. This was seen as likely to result in a much reduced need for subjective decisions and Expert Judgement.

IBA can appreciate the merits of getting trade data from panel banks and then calculating the LIBOR rates itself. It would achieve the objective of anchoring LIBOR to the greatest extent possible in transactions. It would help to minimise any conflicts of interest in production of LIBOR. It would reduce the regulatory and legal risk for panel banks and therefore increase the possibility of realising a virtuous circle of receiving more transactions, enhancing the market representation, making LIBOR ever more hard to manipulate, and thereby attracting more panel banks.

At present, panel banks bear heavy cost and responsibilities in submitting to LIBOR. IBA has sought to mitigate some of the risk by streamlining the submitting process and bringing greater clarity to the administrator's expectations.

Through the evolutionary steps described in this Roadmap, IBA will have established consistency in the eligible transaction types, transaction sizes, counterparty types and funding centres. Having set standard parameters, IBA will be in a position to work in parallel on building out systems and algorithms with a view to collecting trade data from panel banks and removing their Expert Judgement in the determination of LIBOR. Panel banks will still be required to meet the requirements of MAR 8, and later the European Regulation on benchmarks, and the LIBOR Code of Conduct. Accordingly, IBA has started a feasibility study on the design and implementation of a robust algorithm that can allow IBA to produce LIBOR in diverse market circumstances, using transactional data provided by the panel banks as set out in the Waterfall.

Through central collection of real-time trade data by IBA and the use of an algorithm designed by IBA, banks' need to exercise Expert Judgement would cease. A precursor to this development is the standardisation of parameters as set out in this Roadmap.

It must however be recognised that some form of Expert Judgement would still need to be exercised where there are insufficient transactions from banks. The ability to apply Expert Judgement would need to be exercised by IBA.

The indicative timetable for this development is outlined below:

- Q1 2016:

  IBA commences the feasibility study.

- Q2 2016:

  IBA to announce the outcome of the feasibility study.

Subject to a positive outcome to the feasibility study:

- <u>Q2 and Q3 2016:</u>

  IBA to liaise with the FCA to gain regulatory non-objection of the algorithm, processes and controls

- <u>H2 2016:</u>

  Panel banks to connect to IBA within 2016 for real-time transmission of transaction data – this data is currently received daily by IBA via file transfer

- <u>2017:</u>

  IBA to have full centralised responsibility for the formulation of LIBOR.

As part of the centralisation initiative, IBA will be assessing whether further fall-backs are needed and/or whether discontinuation of some tenors may be appropriate.

Further information regarding a centralised approach to the calculation of LIBOR will be published by IBA over the coming months.

APPENDIX 1

GLOSSARY

In the LIBOR Roadmap, the following terms have the meanings shown next to them in the following table:

Term	Meaning
Benchmark Submitter	An organisation that provides LIBOR submissions to IBA. Benchmark Submitters are authorised and regulated by the Financial Conduct Authority
Box 4.B	The part of the Wheatley Review setting out the LIBOR submission guidelines (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/191763/condoc_wheatley_review.pdf)
British Bankers' Association (BBA)	The UK's trade association for the banking sector and the previous administrator of LIBOR
Broker quotes	Prices provided to a LIBOR panel bank by a third party; such prices may be specific to the panel bank or a general indication of the market
Certificate of Deposit (CD)	A promissory note issued by a bank entitling the bearer to receive interest. A CD bears a maturity date, a specified fixed interest rate and can be issued in any denomination
Commercial Paper (CP)	An unsecured promissory note with a fixed maturity, usually sold at a discount rate from face value
Corporation	A non-financial business organisation
Discount	A weighting subtracted from a LIBOR submission to seek to make it representative on the underlying interest
Expert Judgement	Part of the hierarchy of transactions in Box 4.B of the Wheatley Review. Proposed by IBA as Level 3 of the Waterfall of methodologies
Financial Stability Board (FSB)	An international body that monitors and makes recommendations about the global financial system

Floating Rate Certificates of Deposit (FRCD)	Funding instrument issued by a bank that pays a monthly, quarterly, semi-annual or annual coupon based on a floating interest rate
Floating Rate Notes (FRN)	Funding instrument issued by a bank / corporation that has a variable coupon, equal to a money market reference rate, like LIBOR, plus a spread
Forward Rate Agreement (FRA)	An over-the-counter contract between parties that determines the rate of interest, or the currency exchange rate, to be paid or received on an obligation
FSB	(see Financial Stability Board)
Funding centres / locations	The global markets from which panel banks will capture trades on which to anchor LIBOR submissions. IBA will maintain an Approved List of Funding Locations, from which IBA will agree with each LIBOR panel bank the most appropriate funding centres to be used for that bank's submissions
Foreign Exchange (FX) markets	Markets in which currencies pairs are traded in instruments such as FX forwards, FX swaps etc. (FX forward contracts are transactions in which 2 parties agree to exchange a specified amount of different currencies at some future date, with the exchange rate being set at the time the contract is entered into. An FX swap is a simultaneous purchase and sale of identical amounts of one currency for another with two different value dates)
Historical transactions	Trades taken into account by a LIBOR panel bank to inform its LIBOR submissions as the first sub-level of Level 2 (Transaction-derived); such trades have been executed between 3 and 15 days previously, depending on the currency and tenor
IBA	(See ICE Benchmark Administration Limited)
ICE	Intercontinental Exchange Inc., the global group that includes regulated exchanges, clearing houses, post-trade / data services and ICE Benchmark Administration Limited
ICE Benchmark Administration Limited (IBA)	The Benchmark Administrator for ICE LIBOR, ICE Swap Rate and the LBMA Gold Price
ICE LIBOR	The world's most widely used benchmark for short term bank borrowing rates, produced each London business day by IBA for five currencies with seven maturities ranging from overnight to 12 months (35 rates)
LIBOR	(see ICE LIBOR)

LIBOR Oversight Committee	IBA's Oversight Committee that oversees LIBOR, including the industry-led LIBOR Code of Conduct. The Oversight Committee is comprised of Benchmark Submitters (panel banks), benchmark users, Independent Non-Executive Directors and other relevant experts. The composition and terms of reference of the committee are available at https://www.theice.com/iba/libor and https://www.theice.com/publicdocs/Oversight_Committee_Terms_of_Reference_20140424.pdf respectively
LIBOR panel bank	An organisation that provides LIBOR submissions to IBA. (i.e. a Benchmark Submitter)
LIBOR submissions	The rates provided to IBA by the LIBOR panel banks at which they could obtain funding in reasonable market size, for a given maturity and currency. The currency panels vary in size from 11 to 18 panel banks. Each bank's LIBOR submission carries equal weight
Liquidity coverage ratio (LCR)	Liquidity ratio introduced by Basel III regulatory framework defining the amount of liquid assets that have to be held by a financial institution
Methodology	The way in which each LIBOR panel bank determines its submissions, as agreed within the bank's internal governance and currently based on Box 4.B of the Wheatley Review
Non-Bank Financial Institution	An organisation that does not have a banking licence and is not supervised as a bank by any banking regulator
Overnight Indexed Swap (OIS)	An interest rate swap where the periodic floating payment is generally based on a return calculated from a daily compound interest
Overnight trade (O/N)	A transaction with a maturity date of one business day after the trade date (by reference to the business day in the principal financial centre of the relevant currency)
Plain vanilla	A non-complex variety of a financial instrument (i.e. non structured)
Premium	A weighting added to a LIBOR submission to seek to make it representative on the underlying interest
Primary issuance	The process through which companies, governments or public sector institutions can obtain funds through the sale of debt or equity
Repo	A repurchase agreement, which is the sale of securities together with an agreement for the seller to buy back the securities at a later date
Risk-free rate	A rate with a minimal credit element (e.g. OIS, short-dated government bonds, Repos, Central Bank rates).

Risk premium	The minimum amount of money by which the expected return on a risky asset must exceed the known return on a risk-free asset, or the expected return on a less risky asset, in order to induce an individual to hold the risky asset rather than the risk-free asset
Sovereign Wealth Fund	A state-owned investment fund
Spot Next trade (S/N)	A transaction with a maturity date of one business day after the spot date (by reference to the business day in the principal financial centre of the relevant currency)
Submission	(see LIBOR submissions)
Supranational corporation	An international organisation spanning a number of national jurisdictions
Interest Rate Swap	Agreement between two counterparties to exchange cash flows based on a pre-defined notional amount, usually from floating to fixed interest rate or vice versa
Tenor	The maturities in which IBA produces ICE LIBOR in each of 5 currencies. The seven tenors are currently Overnight/ Spot Next, 1 Week,1 Month, 2 Months, 3 Months, 6 Months and 12 Months
Trade Threshold	The minimum volume of a LIBOR panel bank's Level 1 transactions
Trimmed arithmetic mean	The calculation method for LIBOR, by which: Benchmark Submissions are ranked by IBA in descending order; the highest and lowest quartiles of submissions are excluded; and IBA calculates the mean of the remaining Benchmark Submissions
Unsecured Deposit	A deposit that is not protected by a guarantor, or collateralised by a specific asset
Volatility	A statistical measure of the variation of a rate (LIBOR) over time
Wholesale funding	The means by which banks seek financing from professional counterparties (not retail)

APPENDIX 2

LIBOR EVOLUTION FAQs

Q1 What is LIBOR?

A1 ICE LIBOR ("LIBOR") is the primary benchmark for short term interest rates globally. It provides the average rate at which a LIBOR panel bank (i.e. Benchmark Submitter) could obtain unsecured funding for a given period in a given currency.

LIBOR is written into standard derivative and loan documentation, such as the standard terms of the International Swaps and Derivatives Association ("ISDA"), and is used for a wide range of retail products such as mortgages and student loans.

LIBOR is also used as a barometer to measure the health of the banking system and as a gauge of market expectation for future Central Bank interest rates. It is the basis for settlement of interest rate contracts on many of the world's major futures and options exchanges.

Individual LIBOR rates are the end-product of a calculation based upon submissions from LIBOR panel banks. ICE Benchmark Administration ("IBA") maintains a reference panel of between 11 and 18 panel banks for each of the following five currencies:

- CHF (Swiss Franc)
- EUR (Euro)
- GBP (Pound Sterling)
- JPY (Japanese Yen)
- USD (US Dollar).

LIBOR is produced by IBA on each London business day in respect of seven maturities in each of the above five currencies. The maturities are: Overnight ("O/N") or Spot Next ("S/N"); 1 Week; 1 Month; 2 Months; 3 Months; 6 Months; and 12 Months.

LIBOR is calculated using a trimmed arithmetic mean. Once each submission is received, they are ranked in descending order and then the highest and lowest quartiles of submissions are excluded. This trimming of the top and bottom quartiles allows for the exclusion of outliers from the final calculation.

A2 What is the definition of LIBOR?

A2 Currently there is no single definition of LIBOR, rather different participants refer to LIBOR based on varying combinations of:

- Its name - London Interbank Offered Rate
- The question asked of LIBOR submitters, **"***At what rate could you borrow funds, were you to do so by asking for and then accepting inter-bank offers in a reasonable market size just prior to 11 am?"*, and
- Market practice for bank unsecured funding activity.

Some contracts refer to LIBOR based simply on its location on a specific data distributor's screen, while others continue to refer to it as BBA LIBOR.

The British Bankers' Association changed the LIBOR question in 1998 from a rate at which the submitter believed a prime bank would be offered deposits in the market to a rate at which the panel bank itself could borrow funds. This was the last occasion when the definition was re-examined and changed.

Q3 What were the FSB's proposals for LIBOR?

A3 On 22 July 2014, the Financial Stability Board ("FSB") published its proposed reforms for major interest rate benchmarks.

The main areas of discussion in the FSB report revolve around a multiple-rate approach:

(1) Strengthening the existing 'IBORs and other potential reference rates based on unsecured bank funding costs by underpinning them to the greatest extent possible with transactions data ("IBOR+")

(2) Developing alternative, nearly risk-free reference rates (RFR) since FSB Members believe that certain financial transactions, including many derivatives transactions, are better suited to reference rates that are closer to risk-free.

The FSB Report further stated that one of the overarching objectives of the reforms should be that:

"Reference rates should be based exclusively in actual transactions. However, in many cases insufficient transactions will be available to do this and so the degree of dependence on transactions should vary by currency and will depend on market liquidity, depth and data sufficiency. When conditions in the local market do not allow pure transaction rates (ones derived mechanically from transacted data without use of expert judgement), authorities should work with and guide the private sector to promote rates which are derived on a waterfall of different data types: underlying market transactions first, then transactions in related markets, then committed quotes, and then indicative quotes."

Q4 What are the advantages of basing LIBOR in transactions?

A4 The key advantages are:

- Fulfilling the strategic objectives set by the FSB
- Minimising the use of qualitative Expert Judgement in favour of verifiable and auditable data
- Significantly reducing regulatory risk to panel banks, making their submissions less susceptible to manipulation and maximising panel banks' ability to justify evidentially the basis for their submissions, and
- Potentially restoring the panel banks' wish to participate in setting LIBOR and over time attracting new banks wanting to play their part by providing transactional data to IBA for the compilation of ICE LIBOR.

Q5 Is LIBOR still susceptible to manipulation?

A5 The following safeguards have been put in place:

- The introduction by the UK authorities of statutory regulation for the administration of, and submission to, LIBOR, including an Approved Persons regime, to provide the assurance of credible independent supervision, oversight and enforcement, both civil and criminal

- The appointment of IBA as independent administrator and the increased governance that has been put in place in both the submission and administration processes making any manipulation of LIBOR rates harder. IBA is regulated by the FCA and is subject to the FCA's rules specifically related to the administration of the eight most important benchmarks in the UK

- IBA's sole focus is on producing benchmarks to the highest standard and IBA's governance structure includes a board with a majority of Independent Non-Executive Directors

- Implementation by IBA of bespoke surveillance systems, with a dedicated team that assesses the credibility of submissions and seeks to identify breaches of submission standards and tolerances through a combination of alerts and pattern-matching. The panel banks send all of the related funding trades to the administrator every day together with other evidence to support their LIBOR submissions for that day

- Governance and control mechanisms established within the panel banks. Attempted manipulation would now have to involve a significant number of people within one or more banks bypassing control mechanisms. LIBOR panel banks are also regulated by the FCA and must have designated senior managers ("CF40s") who have personal liability, and

- External auditing of administrator and submitters.

Q6 Will LIBOR still be the same benchmark?

A6 IBA is evolving LIBOR to become further anchored in transactions and to have a standardised Waterfall to allow the benchmark to be robust in different and diverse market conditions. Whilst this evolution brings some adjustments to the inputs for the calculation methodology, LIBOR as a benchmark will continue to measure the same underlying interest being the rate at which banks can fund themselves in the wholesale markets.

Q7 Will the parameters be regularly reviewed? How will you ensure LIBOR remains reflective of current market?

A7 The LIBOR Oversight Committee will play an important role in keeping under review the pre-defined parameters that will be put in place.

Q8 *Who are the members of the ICE LIBOR Oversight Committee?*

A8 See table below:

NAME	COMPANY	COMMITTEE POSITION
Mary Miller (Chairperson)	IBA	Independent Non-Executive Director
David Bowman	Federal Reserve System	Observer
David Clark	WMBA	Association Representative
Clare Dawson	LMA	Association Representative
John Grout		Independent Expert
George Handjinicolaou	ISDA	Association Representative
John Harding	ICE	Market Infrastructure Provider
Richard Kennedy	UBS	LIBOR panel bank
Brad Hurrell	Barclays	LIBOR panel bank
Finbarr Hutcheson	IBA President	President
Matthias Juettner	Swiss National Bank	Observer
Kevin Ludwick	Bank of Tokyo Mitsubishi	LIBOR panel bank
Rod Paris	IBA	Independent Non-Executive Director
Will Parry	Bank of England	Observer
Guy Sears	IMA	Association Representative
Frederick Sturm	CME Group	Market Infrastructure Provider
Robert Thurlow	Mizuho Corporate Bank	LIBOR panel bank
Emma Vick	IBA	CF50
André Villeneuve	IBA Chairman	Non-Executive Director

Q9 *Does IBA administer any other benchmarks and does it have any track record for evolving benchmarks?*

A9 IBA is the administrator of the following benchmarks in addition to LIBOR:

- ICE Swap Rate (formerly known as ISDAFIX) which is globally recognized as the benchmark for annual swap rates for interest rate swap transactions. When IBA became the administrator, ISDAFIX was a polled rate (like LIBOR) with contributing banks submitting price estimates. In March 2015, IBA changed the methodology to one based on tradable quotes posted on regulated trading venues, and

- The LBMA Gold Price which is the predominant indicator of the physical spot gold price, accepted worldwide. In March 2015, when IBA became the administrator, the LBMA Gold Price replaced the Gold Fixing that had existed since 1919. IBA now provides a physically settled, electronic, tradeable auction process with aggregated bids and offers published in real-time.

Q10 Where can I find out more about ICE LIBOR and IBA?

A10 Please see https://www.theice.com.

Q11 How do I contact IBA if I have further queries?

A11 Please direct any queries to IBA@theice.com, call +44 (0)20 7429 7100 or contact us by post at:

ICE Benchmark Administration Limited
Milton Gate
60 Chiswell St
London
EC1Y 4SA
