

# Interim Report and Consultation

The Alternative Reference Rates Committee

May 2016

## Summary

In response to the Financial Stability Oversight Council's recommendations and the objectives of the Financial Stability Board, the Federal Reserve convened the Alternative Reference Rates Committee (ARRC) on November 17, 2014 in a meeting with representatives of major over-the-counter derivatives market participants and their domestic and international supervisors and central banks. The ARRC was convened to identify a set of alternative reference interest rates that are more firmly based on transactions from a robust underlying market and that comply with emerging standards, such as the International Organization of Securities Commissions' *Principles for Financial Benchmarks*, and to identify an adoption plan with means to facilitate the acceptance and use of these alternative reference rates. Over the last year, the ARRC has focused on two main tasks, first, narrowing the set of potential alternative rates that might be chosen and, second, considering potential plans for transition to an alternative rate.

After extensive discussion, the ARRC has preliminarily narrowed the list of potential rates to two that it considers to be the strongest alternatives, the **Overnight Bank Funding Rate** and some form of **overnight Treasury general collateral repurchase agreement (GC repo) rate**. Because of the dominance of LIBOR in U.S. dollar interest rate derivative markets, planning for any transition to either rate poses a host of challenges. While the dealers and central counterparties currently represented in the ARRC play key roles in intermediating these markets, demand for interest rate derivatives is ultimately driven by end users. Therefore, it is key that end users play an integral role in the ultimate choice of an alternative and in an ultimate transition strategy. However, end users cannot be expected to choose or transition to trading a benchmark that does not have at least a threshold level of liquidity. Accordingly, the ARRC has thus far focused on formulating an initial transition strategy (the "paced transition") that could potentially provide this threshold level of liquidity. This plan envisions gradually moving price alignment interest and also eventually discounting from the effective federal funds rate to the new rate chosen by the ARRC. If adopted, a paced transition would represent a first step in creating a liquid market for the alternative rate, but further work will be required – following consultation and close involvement with end users – both in developing the details of an initial transition strategy and in planning for a full transition strategy that would move a more significant portion of the derivatives markets away from LIBOR to the new rate.

Following the publication of this interim report, the ARRC intends to consult widely and closely with end users as it seeks to finalize a choice of alternative rate and transition strategies. This interim report concludes with a set of consultation questions (page 27). Comments on the consultation and any questions on the ARRC's plans can be delivered to [arrc@ny.frb.org](mailto:arrc@ny.frb.org). Comments should be received no later than July 15, 2016 and will be posted on the [ARRC's website](#). In addition, the ARRC will host a roundtable at the Federal Reserve Bank of New York on June 21, 2016 and will host other roundtables in coming months if space does not allow for all interested parties to attend the June 21 roundtable. Parties interested in attending a roundtable should indicate their interest by email to [arrc@ny.frb.org](mailto:arrc@ny.frb.org).

## I. Background

The Financial Stability Board (FSB) and Financial Stability Oversight Council (FSOC) have both recognized that the secular decline in wholesale unsecured short-term funding by banks poses serious structural risks for unsecured benchmarks such as LIBOR, Euribor, and TIBOR (IBORs).<sup>1</sup> As it is well understood, without sustainable trading volume and liquidity, price discovery in unsecured short-term markets will remain uncertain, thus affecting the credibility and reliability of the benchmarks that rely on them. Although significant progress has been made in strengthening the governance and processes underlying these benchmarks<sup>2</sup>, these structural risks may threaten their reliability and robustness and cannot be addressed simply through better governance or processes. Instead, these risks are systemic and should be addressed by encouraging the use of alternative benchmarks that are underpinned by greater and more robust market activity.

Because U.S. dollar (USD) LIBOR is used in such a large volume and broad range of financial products and contracts, the risks surrounding it pose a potential threat to the safety and soundness of individual financial institutions, and to U.S. financial stability. Despite the substantive reforms enacted, the scarcity of underlying transactions poses a continuing risk of discontinuity or even cessation in the production of USD LIBOR. Ongoing regulatory reforms and changing market structures raise questions about whether unsecured short-term borrowing transactions may become even scarcer in the future, particularly in periods of stress, which exacerbates these concerns. Absent regulatory encouragement or mandate, banks may feel little incentive to contribute to USD LIBOR panels if transaction volumes erode further given that they incur potential legal risks in doing so and receive no direct benefits. The threat of a sudden cessation of such a heavily used reference rate poses particular risks. It may create substantial legal challenges and could cause considerable disruptions to and uncertainties around the large gross flows of USD LIBOR–related payments and receipts between financial institutions. It would also impair the normal functioning of a variety of markets, including business and consumer lending.

Recognizing these structural instabilities and the need to address concerns about allegations of attempted manipulation of the rate-setting process, the G-20 asked the FSB to undertake a fundamental review of major interest rate benchmarks and of plans for reform. The FSB established a high-level group of global regulators and central banks to examine these issues as well as a Market Participants Group (MPG), which was asked to examine the feasibility and viability of adopting additional reference rates.<sup>3</sup> In line with the recommendations of these groups, the FSB plenary endorsed a two-pronged approach to further reforms. First, the FSB recommended continued work to strengthen IBORs, and second, it recommended developing

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<sup>1</sup> See Financial Stability Board, [Reforming Major Interest Rate Benchmarks](#), July 2014, and Financial Stability Oversight Council, [2013 Annual Report](#), June 2013. See also the BIS Economic Consultative Committee, [Towards Better Reference Rate Practices: A Central Bank Perspective](#), March 2013.

<sup>2</sup> See, for example, [Ice Benchmark Administration Roadmap for ICE LIBOR](#), March 2016, or European Money Markets Institute, [Consultative Position Paper on the Evolution of Euribor](#), October 2015.

<sup>3</sup> [Final report by Market Participants Group on Reforming Interest Rate Benchmarks](#), March 2014.

alternative, nearly risk-free reference rates (rates embedding no or only small amounts of credit risk), noting that certain financial transactions, including many derivatives transactions, may be better suited to reference rates that are closer to risk-free.

The FSB report recognized that market participants' uses of interest rate benchmarks are diverse and that they should be allowed to choose amongst rates that meet the International Organization of Securities Commissions' (IOSCO) *Principles for Financial Benchmarks*.<sup>4</sup> At the same time, the report recognized that authorities have a responsibility for ensuring that the financial institutions they regulate do not use reference rates in ways that pose undue risk to the institutions themselves, to market integrity or to overall financial stability. In regards to USD LIBOR, the report noted that “*given the potential for coordination failure and the large scale economies associated with reference rate choice, there is also a role for the official sector to influence the shift to a risk-free or near risk-free rate for the reference rates used in derivatives.*”<sup>5</sup>

The FSOC's recommendations agree with this approach. In line with the FSB's recommendation to develop and encourage the use of alternative rates, the FSOC 2013 annual report stated:

*Given these vulnerabilities and the real risk that they will remain, in order to ensure market integrity and support financial stability, the Council recommends that U.S. regulators cooperate with foreign regulators, international bodies, and market participants to promptly identify alternative interest rate benchmarks that are anchored in observable transactions and are supported by appropriate governance structures, and to develop a plan to accomplish a transition to new benchmarks while such alternative benchmarks are being identified. The Council further recommends that steps be taken to promote a smooth and orderly transition to alternative benchmarks, with consideration given to issues of stability and to mitigation of short-term market disruptions.*<sup>6</sup>

In response to the FSOC's recommendations and the objectives of the FSB, the Federal Reserve convened the Alternative Reference Rates Committee (ARRC) on November 17, 2014, in a meeting with representatives of major over-the-counter (OTC) derivatives market participants and their domestic and international supervisors and central banks. The ARRC was convened to identify a set of alternative reference interest rates that are more firmly based on transactions from a robust underlying market and that comply with emerging standards, such as the IOSCO *Principles for Financial Benchmarks*, and to identify an adoption plan with means to facilitate the acceptance and use of these alternative reference rates.

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<sup>4</sup> International Organization of Securities Commissions, [Principles for Financial Benchmarks](#), July 2013. A summary of the IOSCO Principles can be found in Appendix 2.

<sup>5</sup> Financial Stability Board, [Reforming Major Interest Rate Benchmarks](#), July 2014, Section V.B.4.4.b., page 43.

<sup>6</sup> Financial Stability Oversight Council, [2013 Annual Report](#), June 2013, Section 3.1.3, page 14.

## II. The Alternative Reference Rates Committee's Mandate

With the support of a number of agencies including the U.S. Department of the Treasury, the U.S. Commodity Futures Trading Commission (CFTC), and the Office of Financial Research, the Federal Reserve Board and Federal Reserve Bank of New York convened the ARRC.<sup>7</sup> At the time of its inception, the ARRC consisted of representatives from 15 large global interest rate derivatives dealers; the Federal Reserve and the US Treasury participated as ex officio members. As its work progressed, the ARRC invited several central counterparties (CCPs) and other organizations to join as members to help in its planning.<sup>8</sup>

The group was charged with identifying one or more alternative risk-free or nearly risk-free USD reference rates that both fit the needs of the market and meet standards of best practice, and with developing plans for the adoption of these rates. More specifically, the ARRC was given four objectives:

- *Identify best practices for alternative reference rates.* The ARRC was asked to consider the range of existing and potential reference interest rates and identify a risk-free (or nearly risk-free) rate or rates that in the consensus view of the members would represent best practice for use in certain new derivatives and other contracts. Considerations were to include, but not be limited to, the liquidity of the underlying market, the likely robustness of the market over time, market functioning issues, usefulness to all market participants, ability to produce and maintain the alternative rates, feasibility and viability of developing a robust market of financial instruments that reference the alternative rates, accounting and tax issues that might facilitate or hinder adoption, and whether the identified alternative rates are consistent with the *Principles for Financial Benchmarks* outlined by IOSCO.
- *Identify best practices for contract robustness.* The ARRC was asked to consider the best practices related to robust contract design in order to ensure that contracts are resilient to the possible cessation or material alteration of an existing or new benchmark.
- *Develop an adoption plan.* The ARRC was asked to identify the factors that would either facilitate or impede the adoption of the alternative rates identified as consistent with best practices or the adoption of best practices related to robust contract design, and to outline the necessary steps that the official sector and market participants could take to make the adoption more successful. Considerations were to include, but not be limited to, the creation of the necessary liquidity in contracts referencing the alternative rates, accounting or tax issues such as the use for simplified hedge

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<sup>7</sup> More information on the ARRC is available at the [ARRC's website](#).

<sup>8</sup> See Appendix 1.

accounting, industry-wide protocols, complementary uses of the rates such as for the discounting, and back office or record-keeping issues.

- *Create an implementation plan with metrics of success and a timeline.* The ARRC was asked to identify observable metrics that reflect the successful adoption of the best practices and the alternative reference rates that are consistent with those best practices, and to identify how participating firms will work to achieve these best practices over time. These metrics could include, for example, quantitative measures for the dollar value or share of new derivatives or other contracts that are linked to such alternative reference rates. The recommendations should include an expected timeline and clear measures of success for the implementation.

The ARRC held its first organizational meeting in December 2014 and has been meeting regularly since January 2015 to work toward these objectives. Over the last year, the ARRC has focused on two main tasks: first, narrowing the set of potential alternative rates that might be chosen (discussed in **Section IV**); and, second, considering potential plans for transition to an alternative rate (discussed in **Section V**). Minutes of the ARRC's meetings are posted on its [website](#) after each meeting. Following the publication of this interim report, the ARRC intends to consult widely and closely with end users as it seeks to finalize a choice of alternative rate and transition plans.

### III. Overview of the Financial Products and Markets Referencing LIBOR

Although LIBOR was first created for use as a reference rate in pricing syndicated loans, over time its use has expanded, and with that expansion its liquidity has increased. Thanks to this liquidity, LIBOR has become the dominant USD reference rate and is now used in a wide array of instruments. However, much of this use is due to the ease of hedging LIBOR in derivatives markets rather than any inherent need for a reference rate based on unsecured bank borrowing. Indeed, while the use of financial products referencing LIBOR has steadily grown, the actual volume of unsecured borrowing transactions underlying LIBOR has been in decline.

The MPG has estimated the notional volume of outstanding financial products indexed to USD LIBOR to be more than \$160 trillion.<sup>9</sup> LIBOR is also often referenced in a wide variety of contracts, for example in late-payments clauses, and is used in accounting, tax, capital, and risk valuation methods, although these types of uses are more difficult to quantify.

Among the uses that could be quantified by the MPG, as shown in **Table 1**, the notional size of the derivatives market dwarfs other products. Interest rate derivatives markets have grown sharply over the last two decades, with over \$200 trillion in notional amount outstanding in USD contracts as of June 2015 (**Exhibit 1**). Taken together, interest rate derivatives account for nearly 90 percent of the outstanding gross notional value of financial products referencing LIBOR. However, LIBOR is referenced in large numbers of corporate loans, retail mortgages, floating rate bonds and securitized products. Although these categories appear small relative to the size of the derivatives market in comparing gross notional amounts outstanding, they are still quite sizable, and the use of LIBOR in these products helps to drive one of the key sources of demand for hedging LIBOR in derivatives markets.<sup>10</sup>

Given the dominance of derivatives in products referencing LIBOR and the belief that in many instances these instruments are used to hedge general interest rate risk rather than unsecured bank funding costs, the FSB report identified derivatives as a key target for transition to alternative rates, stating that “*shifting a material proportion of derivative transactions to a risk-free rate would reduce the incentive to manipulate rates that include bank credit risk and would reduce the risks to bank safety and soundness and to overall financial stability.*”<sup>11</sup>

<sup>9</sup> [Final Report by Market Participants Group on Reforming Interest Rate Benchmarks](#), March 2014.

<sup>10</sup> Although net exposures would be much smaller, exposures based on gross notional values are important to measure from a financial stability perspective. Derivative contracts do not in general have robust backups in the event that LIBOR ceased to be published, and untangling the numerous cross-institution financial obligations that would result from such an event would be operationally complicated and could be legally contentious. In the interim, individual banks would have no firm certainty about the value of their positions as it would be unclear what rate should be paid or what rate would be received on any contract. The value of these contracts would depend on the movement in interest rates since the time that they were entered into.

<sup>11</sup> Financial Stability Board, [Reforming Major Interest Rate Benchmarks](#), July 2014, Section III.C, page 11.

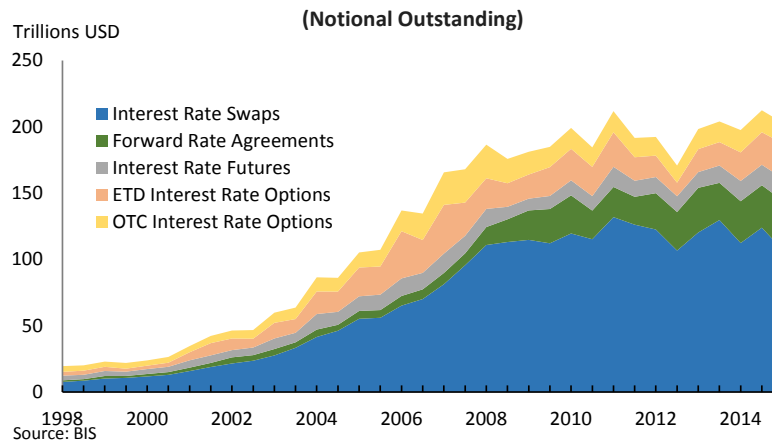
**Table 1: USD LIBOR Market Footprint by Asset Class<sup>1</sup>**

		Volume (\$BN)	% LIBOR Related
<b>Loans</b>	Syndicated loans <sup>2</sup>	~3,400	97%
	Corporate business loans <sup>2</sup>	1,650	30–50%
	Noncorporate business loans	1,252	30–50%
	CRE/Commercial mortgages	3,583	30–50%
	Retail mortgages	9,608	15%
	Credit cards	846	Low
	Auto loans	810	Low
	Consumer loans	139	Low
	Student loans	1,131	7%
	<b>Bonds</b>	Floating/Variable Rate Notes	1,470
<b>Securitization</b>	Residential mortgage-backed securities	~7,500	24%
	Commercial mortgage-backed securities	~636	4%
	Asset-backed securities	~1,400	37%
	Collateralized loan obligations	~300	71%
<b>Over-the-Counter Derivatives</b>	Interest rate swaps	106,681	65%
	Forward rate agreements	29,044	65%
	Interest rate options	12,950	65%
	Cross currency swaps	22,471	65%
<b>Exchange Traded Derivatives</b>	Interest rate options	20,600	98%
	Interest rate futures	12,297	82%

<sup>1</sup> Source: Market Participants Group (2013). Data as of year-end 2013. Some overlap exists between estimates of syndicated and corporate business loans.

> \$5 Trillion Estimated USD LIBOR Exposure  
 \$1-\$5 Trillion Estimated USD LIBOR Exposure  
 < \$1 Trillion Estimated USD LIBOR Exposure

**Exhibit 1: U.S. Dollar Interest Rate Derivatives**

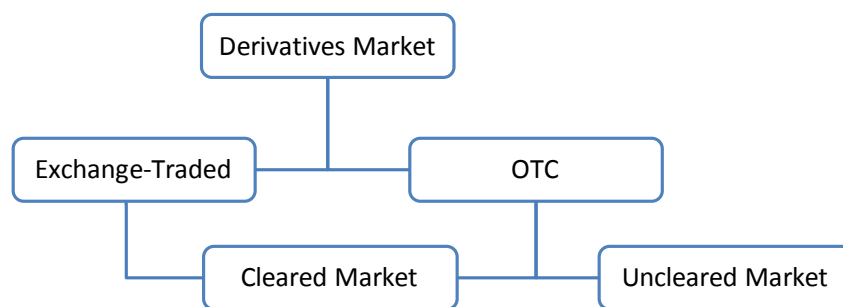




*Interest Rate Derivatives Markets*

The derivatives market is broadly divided into two segments, the exchange-traded (ETD) and OTC markets, based on where and how they are traded (**Exhibit 2**). The OTC market can be further separated into (a) the segment that is centrally cleared, in which each party to a derivative contract faces a CCP that substitutes itself as a counterparty to the contract, and (b) the non-centrally cleared (uncleared, or bilateral) segment, in which each party to a derivative contract (often a swap dealer on one side and a customer on the other) bears the credit risk of the counterparty.

**Exhibit 2. Derivatives Market Segments**



LIBOR is widely referenced in many types of OTC and ETD interest rate derivatives (**Box 1**). Major cleared USD OTC interest rate derivative products predominantly reference LIBOR. During 2016 Q1, for example, LCH.Clearnet Ltd (LCH) cleared an average volume of roughly \$992 billion per day in notional principal value of USD interest rate swaps (IRS) and forward rate agreements (FRAs), 26 percent of which were overnight index swaps (OIS) referencing the effective federal funds rate (EFFR) and 74 percent of which referenced LIBOR.<sup>12</sup> During the same interval, Chicago Mercantile Exchange Inc. (CME) cleared an average of \$77 billion per day in notional principal value of USD IRS and FRAs, 16 percent of which were OIS referencing the EFFR and 84 percent of which referenced LIBOR.<sup>13</sup>

A substantial portion of ETD interest rate derivatives also rely on LIBOR, although there are futures and options that reference other interest rate benchmarks including the EFFR and Treasury securities. For illustration, open interest held in interest rate futures cleared by CME on March 31, 2016, was over 18 million contracts with an aggregate notional value over \$15 trillion.<sup>14</sup> Contracts referencing LIBOR made up 65 percent of this aggregate notional value and contracts referencing the EFFR made up roughly 30 percent.<sup>15</sup>

<sup>12</sup> Source: LCH Swapclear ([www.lchclearnet.com/swaps/volumes/daily\\_volumes.asp](http://www.lchclearnet.com/swaps/volumes/daily_volumes.asp))

<sup>13</sup> Source: CME Group (<ftp://ftp.cmegroup.com/irsvoi/OTC-IRS-Complete-History.xlsx>)

<sup>14</sup> Source: CME Group (<http://www.cmegroup.com/market-data/volume-open-interest.html>)

<sup>15</sup> If gauged in terms of interest rate sensitivity (the dollar value of a change in market interest rates of one basis point per annum (DV01)), then aggregate open interest represented roughly \$992 million per basis point, approximately 25 percent of which was due to futures referencing LIBOR, with around 3.5 percent due to futures

**Box 1. Key Types of Interest Rates Derivatives:**

Interest rate swap (IRS): A swap in which periodic payments are exchanged based on a fixed rate that is agreed upon at execution and a specified floating rate index. The floating rate on USD IRS is typically LIBOR.

Overnight index swap (OIS): A particular form of interest rate swap where the floating rate reference index is an overnight rate, typically the EFFR for USD contracts. In an OIS contract, parties agree to swap a floating interest rate based on a compounded average of the overnight index rate in exchange for a fixed interest rate.

Forward rate agreement (FRA): A swap that starts at a future specified date, generally with one exchange of payments on the start date based on the present value of the difference between the agreed fixed rate and the observed floating rate on that day.

Interest rate future: A futures contracts on interest-bearing instruments. Eurodollar futures (which reference LIBOR), Fed Funds futures, and Treasury futures are all commonly traded.

Basis swap: A swap in which periodic payments are exchanged based on two floating rate indexes, both denominated in the same currency. Basis swaps between LIBOR and the EFFR are most prevalent in the USD market.

Cross currency swap: A swap in which periodic payments are exchanged based on two floating rate indexes that are denominated in different currencies (typically LIBOR rates in two different currencies); notional amounts are exchanged on the effective date and the maturity date.

Swaption: An OTC option that provides the buyer with the right, and the seller with the obligation, to enter into an IRS at an agreed-upon fixed rate at a specified future date (the exercise date).

Futures Option: An ETD option that provides the buyer with the right, and the seller with the obligation, to enter into an interest rate futures contract at an agreed-upon price at the exercise date.

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that reference EFFR, and approximately 71.5 percent due to futures for physical delivery of Treasury notes or bonds (Source: CME).

### *Market Structure*

ETD contracts are listed at and traded on exchanges and cleared by a CCP. ETDs such as futures and options have standardized terms including valuation, collateralization, and settlement methods.

Traditionally, OTC derivatives were traded primarily on a bilateral (uncleared) basis. In bilateral markets, terms are negotiated and agreed upon, and transactions take place between parties without involving organized trading venues or central clearing. However, since global OTC derivatives reform efforts began in 2009, the market structure for OTC derivatives has changed significantly, dividing the market (as discussed above) into centrally cleared and bilateral segments. This is particularly true in the United States, where many of the rules for reforming the OTC derivatives markets (for example, central clearing, organized swap execution facility (SEF) trading, and trade reporting) have already been implemented. These reforms have transitioned a large portion of OTC interest rate and credit derivatives to central clearing and SEF trading, pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010.<sup>16 17</sup>

Accordingly, a large proportion of standardized OTC interest rate derivatives are now traded on SEFs and are also cleared by CCPs.<sup>18</sup> Currently, CME and LCH dominate the cleared market segment for USD OTC interest rate derivatives. These CCPs guarantee the payment of the obligations arising from such contracts. They also perform daily valuation and mark to market processes using reference rates set in their rulebooks and membership agreements until the final maturity date. In calculating daily mark to market valuations and the amounts of variation margin that must be transferred, the CCPs discount future expected cash flows using a discount curve to calculate the net present value of each contract. To align the economics of cleared derivatives with uncleared derivatives, both CCPs include a price alignment amount (sometimes referred to as price alignment interest, or PAI) on variation margin. Both currently use OIS curves based on the EFR for discounting, and both use the EFR as the daily rate of PAI on USD margin collected in respect to USD IRS contracts (see **Box 2** for more discussion).

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<sup>16</sup> In the United States, jurisdiction over OTC derivatives is bifurcated between the CFTC and the SEC. The CFTC has jurisdiction over “swaps,” some examples of which are: OTC FX derivatives (for example, NDFs, options); CDS on broad-based indexes; interest rate derivatives (for example, IRS, FRA, OIS, basis swaps); and commodity swaps. Many of the key reform rules for “swaps” markets under the jurisdiction of the CFTC have been finalized and implemented. The SEC is finalizing reform rules for “security-based swaps” such as single name CDS and swaps on narrow-based securities indices.

<sup>17</sup> Approximately 75 percent of interest rate and credit default swap transactions in U.S. markets are currently being cleared, as compared to only about 15 percent in 2007 (Source: Timothy Massad, CFTC Chairman, Remarks before the 2016 P.R.I.M.E. Finance Annual Conference January 26, 2016).

<sup>18</sup> The current set of SEF trading mandated products that are also required to be cleared include benchmark vanilla IRS denominated in USD, euro, and sterling as well as the on-the-run and most recent off-the-run series of the five-year untranch CDX North American Investment Grade and High Yield indexes and the European iTraxx Europe and Europe Crossover indexes. The clearing requirement also extends to plain-vanilla (fixed to floating) IRS, basis swaps, and FRAs referencing LIBOR denominated in USD, euro, yen and sterling; OIS referencing EFR; and certain CDS indices.

**Box 2: PAI and OIS Discounting**

**Price alignment amount or price alignment interest (PAI):** PAI for a centrally cleared derivative is an amount calculated by applying an overnight interest rate to the variation margin (VM) for the derivative in order to align the economics of the cleared derivative with the economics of uncleared derivatives (for which interest is paid on cash VM postings). The position holder who has a cleared derivative contract with positive net present value (NPV) – i.e. “in the money” – pays PAI and, conversely, the position holder who has a cleared derivative contract with negative NPV – i.e., “out-of-the money” – receives PAI. For USD denominated derivatives, the PAI amount is calculated by applying the EFFR, which is annualized on an actual/360 basis, to contract NPV. Since PAI is a cost-of-funding adjustment, the interest rate is chosen in conformity with the currency denomination of the derivative contract. For centrally cleared derivatives, each CCP’s rules dictate the legal and regulatory treatment of both variation margin and PAI.

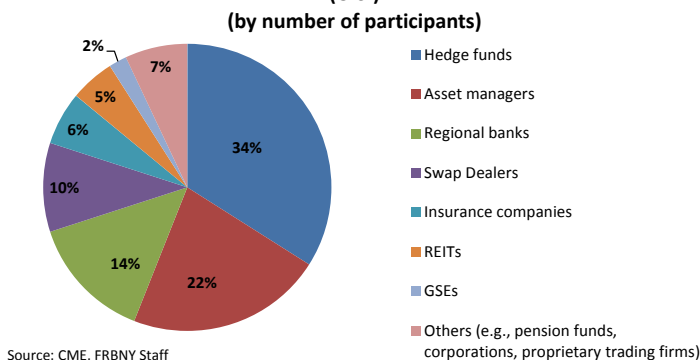
**OIS discounting:** OIS discounting refers to the discounting of expected cash flows of a derivative using a nearly risk-free curve. Most dealers and CCPs now use interest rates based on OIS rates for discounting of derivatives. Under OIS discounting, the specific reference rates linked to a particular swap are used to generate expected future cash flows, but the NPV of these cash flows is calculated using an OIS discount curve. In the past, the conventional way for pricing IRS was to discount the cash flows of the swap by using the LIBOR curve, but since the 2008 financial crisis, there has been a shift toward using OIS discount factors as market participants recognized that LIBOR and OIS rates had diverged and that OIS discounting was more appropriate. With this switch, USD PAI and discounting were linked to the EFFR, and many market participants now see a tight link between PAI and discounting as crucial to the effectiveness of their hedging strategies and accounting requirements.

In the bilateral (uncleared) market segment, transactions are mostly documented under International Swaps and Derivatives Association Inc. (ISDA) master agreements. Other terms of bilateral trades are determined by ISDA credit support annexes (CSAs), agreements between dealers and their customers specifying terms for posting collateral and the payment of interest on cash collateral. Post-execution, dealers perform daily valuation or mark to market processes based on the agreed upon terms. As with cleared contracts, most CSAs specify the EFFR as the rate paid on USD cash collateral and most dealers discount future cash flows using OIS curves (based on the EFFR) for valuing collateralized bilateral contracts.

**Market Participants**

The range of counterparties transacting in interest rate derivatives is quite broad (**Box 3**). Participants can be divided into two broad categories: swap dealers (dealers) and end users. Most dealers act primarily as market makers, providing liquidity by entering into OTC or ETD transactions to profit from the bid and ask spread. Prominent end users include hedge funds, asset managers, insurance companies, and non-financial corporations (**Exhibit 3**). According to ISDA surveys, almost 90 percent of end users surveyed use derivatives to help manage their risks and/or reduce financing costs.<sup>19</sup>

**Exhibit 3. Cleared OTC Interest Rate Swap Market Participants (U.S.)**



Dealers play a special role within this system, helping to make markets and hedging their own aggregated risk exposure through risk offsetting contracts. Thus, dealers have a large footprint in trading interest rate derivatives. For example, according to the CFTC April 19, 2016 report on large position holders, dealers held close to half of the gross long positions in CME Eurodollar futures contracts.<sup>20</sup> At the same time, dealers tend to hedge these positions with offsetting trades – according to the same CFTC report, dealers also hold the largest share of gross short positions in these Eurodollar futures contracts. Thus, although dealers are crucial to the system of trading in interest rate derivatives, demand for these derivatives is largely driven by end users.

**Box 3. Who uses interest rate derivatives?**

Asset managers use interest rate derivatives for investing and hedging the assets of funds under their management.

Hedge funds employ advanced investment strategies using interest rate derivatives to maximize returns or hedge their funding costs (in some cases hedge funds may also act as dealers in these markets).

Other end users such as insurance companies, pension funds, corporations, and regional banks are all prominent end users with underlying assets or interest rate exposures and use interest rate derivatives to reduce or limit their risk.

Dealers typically act as market makers, responding to client demands to buy or sell while seeking to hedge positions.

<sup>19</sup> [Survey of Issues and Trends for the Derivatives End-user Community](#) (ISDA, 2015)

<sup>20</sup> The [Commitments of Traders \(COT\) reports](#) provide a breakdown of open interest for markets in which 20 or more traders hold positions equal to or above the reporting levels established by the CFTC. Gross long (short) positions are the sum of long (short) and spreading positions.

#### IV. Potential Alternative Risk-Free Rates Identified by the ARRC

As noted in Section I, many of the official sector's concerns regarding LIBOR are driven by the secular decline in short-term wholesale unsecured borrowing – the markets that LIBOR is meant to represent. In convening the ARRC, the Federal Reserve asked the group to consider potential risk-free or nearly risk-free alternative rates based on more active and robust markets. According to these criteria, the markets considered should be highly liquid, with a large set of daily transactions, such that one should reasonably expect them to remain in this condition under all but the most extreme circumstances. Given its paramount role in setting U.S. monetary policy, the Federal Reserve also made clear that in its opinion the chosen rate should not restrict its future monetary policy choices; for example, the Federal Reserve requested that the ARRC avoid choices that could be seen as a constraint on changing the monetary policy framework in the event that such changes were considered in the best interest of meeting the Federal Reserve's congressionally-mandated policy goals.

With these considerations in mind, ARRC members began their deliberations by creating a list of criteria to judge potential rates against (**Box 4**). The ARRC criteria rely heavily on the IOSCO Principles, with the view that any chosen alternative should meet those principles. This is in line with the work of the Treasury Markets Practice Group, which has likewise recommended the use of financial benchmarks that are consistent with the IOSCO Principles into its Best Practice Guidance.<sup>21</sup>

The Market Participants Group had previously done extensive work evaluating a range of potential alternative rates.<sup>22</sup> Based on this work, the ARRC considered the following sets of alternatives:

1. Overnight unsecured lending rates – the EFFR or the OBFR
2. Secured general collateral (GC repo) lending rates
3. Policy rates – the Fed Funds target, the interest on excess reserves (IOER) rate, and the rate paid on overnight reverse repurchase (RRP) agreements
4. Treasury bill or bond rates
5. Term OIS rates
6. Term unsecured lending rates

After extensive discussion, **the ARRC has preliminarily narrowed this list to two rates that it considers to be the strongest potential alternatives, the OBFR and some form of overnight Treasury GC repo rate.** A brief summary of the ARRC's evaluations of all the rates it considered is provided below.

<sup>21</sup> [TMPG Releases Updated Best Practice Guidance to Address the Use of Financial Benchmarks](#), February 2016.

<sup>22</sup> [Final Report of the Market Participants Group on Reforming Interest Rate Benchmarks](#), March 2014.

**Box 4: ARRC Criteria for Potential Alternative Reference Rates**

- **Benchmark Quality**

The degree to which the benchmark design ensured the integrity and continuity of the rate. The underlying market was evaluated according to its:

- Liquidity
- Transaction volume
- Resilience through periods of illiquidity
- Resilience to changes in regulatory approach
- Potential that the benchmark may constrain or be adversely affected by changes in the monetary policy framework

- **Methodological Quality**

The degree to which the benchmark construction could satisfy the IOSCO Principles for soundness and robustness. Rates were also evaluated according to:

- Standardized terms for data inclusion
- Transparency of data
- Availability of historical data

- **Accountability**

Evidence of a process that ensures compliance with the IOSCO Principles

- **Governance**

Evidence of governance structures that promote the integrity of the benchmark

- **Ease of Implementation**

Assessed ease of transitioning to the rate, including:

- Anticipated demand for and relevance to hedging/trading
- Existence of or potential for a term market in the underlying rate

*Alternatives Considered to have the Strongest Potential***Overnight Unsecured Lending Rates**

In contrast to short-dated term unsecured borrowing markets, overnight unsecured borrowing markets continue to display consistent transactions activity. The Federal Reserve now publishes two separate rates based on these markets, the EFFR and OBFR.<sup>23</sup> The EFFR is a volume-weighted median of overnight transactions in the fed funds market while the OBFR is a volume-weighted median of both overnight fed funds and Eurodollar transactions. Data for both rates are based on daily transactions by a wide set of over 150 banks active in the United States as reported to the Federal Reserve through its FR 2420 data collection, a more comprehensive sample than that represented by overnight USD LIBOR. According to this data, overnight Fed Funds transactions average roughly \$70 billion per day, and overnight Eurodollar transactions average roughly \$240 billion, thereby displaying ample liquidity and transactions volume. Activity has tended to decline around quarter- and year-ends, but even then transactions volumes have remained sizeable. This is especially true for the OBFR, which combines both fed funds and Eurodollar transactions, representing what amounts to an average of over \$300 billion of transactions per day.

As discussed in Section III, OIS based on the EFFR are already traded and play an important role in discounting and hedging interest rate risk. It was therefore natural for the ARRC to consider the EFFR as a potential candidate rate, especially given that the pre-existing market and role in discounting would greatly ease a market transition. However, several considerations – overall market size, diversity of counterparties, robustness, and degree of potential constraint to the monetary policy framework – have led the ARRC to prefer the OBFR rate (**Box 5**).

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<sup>23</sup> See Federal Reserve Bank of New York's [EFFR website](#) and [OBFR website](#) for historical data and calculation methodology.



**Box 5: Reasons for Preferring the OBFR to the EFR as an Alternative to LIBOR****Size of Market**

The OBFR reflects roughly \$300 billion in both daily overnight federal funds and Eurodollar transactions, while the EFR reflects roughly \$70 billion in daily overnight federal funds transactions only.

**Diversity of Counterparties**

Although the number of transactions underlying the EFR is substantial, the number of counterparties currently lending in this market is fairly limited. Over 90 percent of overnight fed funds transactions are lent by one of the government sponsored entities (GSEs).<sup>\*</sup> These entities are precluded from earning interest on excess reserves by depositing funds directly at the Federal Reserve, and thus they tend to lend to institutions (frequently foreign financial institutions) that can earn the IOER rate. In comparison, the Eurodollar transactions incorporated in the OBFR represent a broader set of lenders.

**Potential Robustness**

The lending by the GSEs in the fed funds market helps to keep money market rates in line with the Federal Reserve's target, but there are also several potential risks to this segment of the market. First, any narrowing between the rates at which GSEs lend and the IOER rate could substantially reduce the profitability of these trades. In addition, impending higher regulatory capital requirements for foreign banks will also likely reduce the profit from these transactions. Second, an increase in financial stresses could dissuade some GSEs from lending in this market if doing so is perceived to be more risky. In any of these circumstances, given the limited set of actors currently in the fed funds market, the number of transactions underlying the EFR could very quickly fall to quite low levels. Although some of these same considerations would also have an effect on the OBFR, the much greater scale of transactions that underlie it would likely leave it with a still substantial underpinning.

**Potential to Constrain Monetary Policy**

The ARRC also believed that promoting the use of a current policy target rate such as EFR as an alternative to LIBOR could instill expectations that the FOMC would maintain the current policy framework. Because the OBFR is not the current the target rate of the FOMC, these considerations do not affect it.

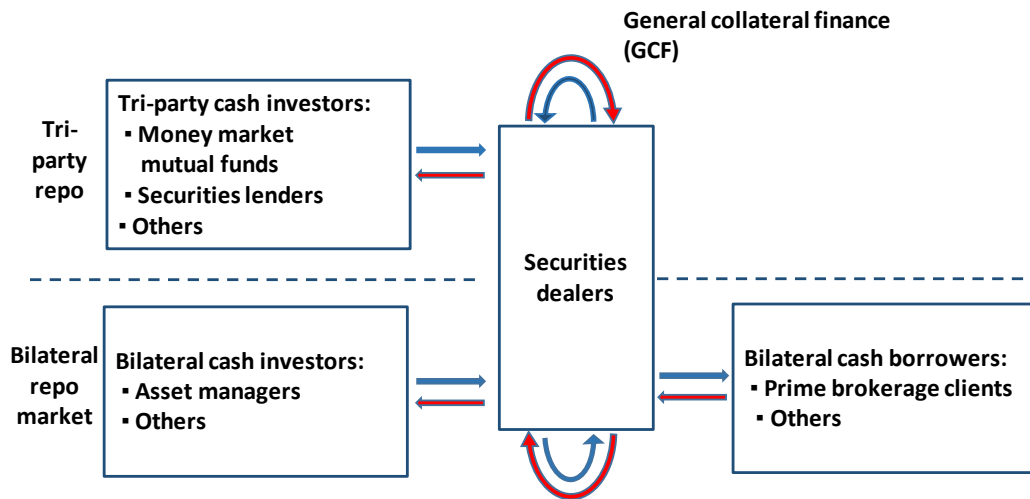
<sup>\*</sup>See [data release](#), Money Markets after Liftoff: Assessment to Date and the Road Ahead, Simon Potter (2016).

**Secured (GC Repo) Lending Rates**

The second potential alternative rate identified by the ARRC is a rate based on overnight secured Treasury GC repo lending. This assessment is based on the high number of transactions in this market, its perceived robustness, and its relevance as a funding source for a wide set of financial market participants.

The U.S. repo market is composed of several segments (Exhibit 4). The tri-party repo market is used to finance general collateral pools rather than specific securities, and trades in this portion of the market are settled on the books of the two clearing banks, Bank of New York Mellon and JP Morgan Chase.<sup>24</sup> Money market mutual funds and securities lenders are among the most prominent cash providers in this segment, while securities dealers are the primary borrowers of cash. Dealers may use this cash to fund their own portfolios or they may also lend it to other dealers in the general collateral finance (GCF) repo market. The GCF segment is cleared through the Fixed Income Clearing Corporation. In the bilateral market, participants may impose narrow restrictions on the specific securities eligible for collateral, but many trades are still primarily intended to lend and borrow cash on a secured basis (cash trades) rather than to obtain a particular security (specials). In this portion of the market, cash providers tend to be professional investors such as asset managers or securities dealers themselves, while cash borrowers include prime brokerage clients. As in tri-party, securities dealers may also borrow cash in this market, or may borrow it and then lend it to other dealers.

**Exhibit 4: The U.S. Repo Market**



<sup>24</sup> *General collateral* or *GC* repo involve repo transactions secured by a range of Treasury or other assets that are accepted as collateral by the majority of intermediaries in the repo market. Treasury GC repo assets are high quality and liquid, but not subject to exceptional specific demand.

Based on figures from September 2015, the size of the tri-party repo market was approximately \$1.5 trillion, of which the GCF market was approximately \$300 billion.<sup>25</sup> The general lack of data on bilateral repo activity makes it difficult to know the precise size of each individual segment of that market, but bilateral repo and securities lending taken together accounted for approximately \$1.7 trillion in outstanding activity.<sup>26</sup> As with unsecured lending, the bulk of secured lending is on an overnight basis. Overnight tri-party Treasury transactions currently average about \$300 billion per day, excluding RRP operations conducted by the Federal Reserve.<sup>27</sup> Volumes in overnight bilateral transactions are thought to be of comparable size.<sup>28</sup>

Although the ARRC has identified this market as a potential alternative, it has not yet identified a specific rate. Several privately produced alternatives based on the tri-party GC and GCF markets are currently produced, but the ARRC has expressed some preference for a rate produced by the public sector. The Federal Reserve has stated (in the [December 2015 FOMC minutes](#)) that it is currently considering producing a Treasury repo rate in cooperation with the Office of Financial Research, but no details are available yet on what such a rate would entail. The ARRC itself has expressed a preliminary preference for a rate that includes both tri-party and bilateral transactions although the practical feasibility of including both types of transactions is unclear.

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<sup>25</sup> [Clearing in an Interdependent World](#), Jerome Powell 2015.

<sup>26</sup> These estimates are based on the methodology described in Adam Copeland, Isaac Davis, Eric LeSueur, and Antoine Martin (2012), "[Mapping and Sizing the U.S. Repo Market](#)".

<sup>27</sup> See [data release](#), Money Markets after Liftoff: Assessment to Date and the Road Ahead, Simon Potter (2016).

<sup>28</sup> More information on bilateral markets can be found in [The U.S. Bilateral Repo Market: Lessons from a New Survey](#) (Office of Financial Research).

## *Alternatives Considered but Ultimately Deemed Less Suitable*

### **Policy Rates**

While policy rates such as the federal funds target, IOER or RRP rate scored relatively well in terms of transparency and resilience to periods of illiquidity and regulatory changes, they were found not to be viable by the ARRC for several reasons. These rates are all part of the current monetary framework, but there is no guarantee that this framework need remain unchanged over time. Indeed, the Federal Open Market Committee (FOMC) has stated that the RRP facility is meant to be temporary.<sup>29</sup> Likewise, the FOMC currently sets a target range for the EFFR, but the use of a target range is also a relatively new innovation. The ARRC also believes that promoting the use of a current policy target rate as an alternative to LIBOR could instill expectations that the FOMC would maintain the current policy framework.

### **Treasury Bill or Bond Rates**

The Treasury market is generally regarded as the deepest and most liquid fixed-income market in the world. Data from the weekly FR 2004 Government Securities Dealer reports indicate that primary dealer Treasury bill transaction volumes currently average about \$80 billion per day and Treasury bond volumes average about \$350 billion.<sup>30</sup> There are also some precedents for the use of Treasury rates as benchmarks; for example, historically, some floating-rate mortgages were based on the U.S. Treasury's Constant Maturity Treasury (CMT) rates, although almost all new floating-rate mortgages now reference LIBOR.

However, while these factors imply that Treasury bill or bond rates scored highly against several of the ARRC's main criteria (liquidity, robustness, existence of a term market), there are several criteria that the ARRC felt were not met. Most importantly, Treasury rates respond to safe haven demands. Treasury rates have tended to decline in periods of stress even as other money market rates have risen. Treasury bill rates can also fluctuate due to technical factors and the amount of issuance. ARRC members felt that these properties would make Treasury rates less appealing to most market participants because they would be less effective in hedging private-sector risks and funding costs. Therefore, the ARRC believed it would be difficult to implement a transition from LIBOR to a Treasury benchmark.

### **Term OIS Rates**

The MPG extensively discussed and the ARRC also considered the potential to use term OIS rates (the fixed rate negotiated to receive the floating fed funds rate over a specified period) as a benchmark. OIS transactions are highly liquid, in the sense that trades of good size may be made

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<sup>29</sup> September 2015 FOMC [Policy Normalization Principles and Plans](#).

<sup>30</sup> Typical bid-ask spreads on bills and nominal coupon securities are less than one basis point. Seasoned coupon securities with remaining maturities of less than a year trade less frequently than bills and, as a result of their lower liquidity, typically yield one to three basis points more than comparable-maturity bills.

with little price impact, deriving in part from the OIS market's tight links with other IRS and the Fed Funds futures market. However, as already noted, USD OIS currently reference the EFR in determining their contractual cash flows. Given the potential concerns that have led the ARRC to prefer either the OBFR or an overnight Treasury GC repo rate to the EFR, use of term OIS as currently configured was not deemed viable by ARRC members. Term OIS referencing the new rate to be chosen by the ARRC could eventually become viable alternatives as reference rates, if the new OIS markets developed sufficient liquidity and trading volumes.

### **Term Unsecured Lending Rates**

The ARRC also discussed potential types of term unsecured lending rates – financial commercial paper (CP), certificates of deposit, term Eurodollar or term federal funds transactions – but did not extensively consider them because of several key structural difficulties with such rates (difficulties shared by LIBOR).

- Limited Transactions. As discussed in Section I, even in normal times, short-term wholesale unsecured transactions are relatively sparse.
- Not Robust to Stress. Term wholesale unsecured borrowing is substantially less frequent during periods of stress, particularly at longer maturities. For example, the Federal Reserve was able to compute three-month AA-rated financial CP rates for only 10 of the 40 trading days over November and December 2008.
- Unstable Sample. The sample of firms that borrow in short-term unsecured wholesale markets is not stable over time because firms access these markets intermittently. This will create fluctuations in observed rates unless daily changes in the credit quality of the firms accessing these markets is controlled for, something that is technically difficult to do without changing the basic nature of the benchmark. The sample of firms is also not stable across maturities, as weaker (stronger) firms typically borrow more at shorter (longer) tenors. This difference is heightened during times of stress.

## V. Transition Strategies

Because of the dominance of LIBOR in USD interest rate derivatives markets, planning for any transition poses a host of challenges. As noted in Section III, although the dealers and CCPs currently represented in the ARRC play key roles in intermediating these markets, demand for interest rate derivatives is ultimately driven by end users. Therefore, it is essential that end users play an integral role in the ultimate choice of an alternative and in an ultimate transition strategy. However, end users cannot be expected to choose or transition to trading a benchmark that does not have at least a threshold level of liquidity. Accordingly, the ARRC has thus far focused on initial transition strategies that could potentially provide this threshold level of liquidity, work in which the current members all have highly specialized knowledge given their positions in these markets. **Following the consultation set forth in this paper, the ARRC intends to consult closely with a range of end users and other interested parties as it seeks to make a final assessment of, and choice on, alternatives and transition strategies.**

Because both of the potential alternatives preliminarily identified by the ARRC are overnight rates, the need to build an initial level of demand and liquidity in derivatives markets based on either rate will necessarily involve transitioning some current private sector uses of the EFR, the current overnight index used by market participants, to the new overnight interest rate benchmark (new rate) that the ARRC will eventually propose. Therefore, the ARRC has mapped out a potential initial strategy for moving PAI and discounting (both described in **Box 2**) to the new rate. This strategy has been crafted to avoid any changes in existing contracts – the ARRC envisions a paced transition focusing on new transactions rather than a “big bang” that would seek to change existing trades – thereby minimizing market disruptions while still creating a robust source of demand for and underlying liquidity in hedging markets for the new rate.

An essential precondition to successful implementation of this paced transition strategy would be voluntary trading by ARRC member banks and other market participants sufficient to achieve a critical mass of liquidity in futures contracts and/or OTC derivative contracts that reference the new rate. Ideally, such trading activity would foster rapid accumulation of price histories that indicate the dynamics of the term structure of medium- to long-dated exposures in the new rate - either through prices of futures contracts based on the new rate, for deferred expiration months, or through the term structure of fixed rates for medium- to long-dated OIS contracts that reference the new rate, or both. The availability of adequate historical data for risk modelling, in turn, would pave the way to adoption of the new rate by CCPs, derivative dealers, and derivative users as a viable successor to EFR, for the purposes of valuation and margining, risk management, and determination of PAI. Successful implementation will also require thoughtful consideration of the effects of evolving derivatives rules and adjustments to firm’s operational constructs to support a paced transition.

Provided that these conditions are met, under the paced transition plan, CCPs would announce that, as of a specified future date, PAI on newly registered IRS contracts for clearing would be calculated on the basis of the new rate. (Adding these new IRS to the contract structures that are currently accepted for clearing by CCPs would of course require the support of clearing members and other liquidity providers.) These new trades would exist within the same clearing pool as existing IRS contracts with PAI calculated using EFR. Under this strategy, as legacy contracts using EFR for PAI matured, or were closed out or liquidated, over time, the clearing pool would consist of only IRS that use the new rate for PAI. Based on market demand, the growth of reasonably deep and reliable liquidity pools in OIS and/or futures contracts that reference the new rate, and their respective individual rules and business strategies, both CCPs would also be expected to eventually move discounting to the new rate.

There are a number of sequential steps that would need to take place in this paced transition plan (outlined in **Box 6**). Given the need for further consultation on both the rate and transition planning, the ARRC has not mapped out a specific timeline for this sequencing.

Although the plan refers specifically to PAI paid by the CCPs given that most new standardized IRS contracts are now cleared, it is expected that counterparties will also seek to adjust the interest on collateral specified in their CSAs to the new rate. Because amendments to these agreements must be negotiated on a case-by-case basis, and because market participants will likely need to focus documents and collateral management resources on the implementation of the uncleared derivatives margin rules that are being implemented across multiple jurisdictions, this portion of a paced transition is expected to take a longer period of time.

**Box 6: Basic Steps Envisioned in a Paced Transition**

1. ARRC consults with end users and finalizes implementation planning and chooses a new rate.
2. Infrastructure for futures and/or OIS trading in the new rate is put in place by ARRC members.
3. Trading begins in futures and/or bilateral, uncleared, OIS that reference the new rate.
4. Trading begins in cleared OIS that reference the new rate.
5. CCPs begin accepting new or modified swap contracts (swaps paying floating legs benchmarked to EFR, LIBOR, and the new rate) that pay the new rate as PAI. In this stage, market participants are allowed a choice between clearing contracts that calculate PAI using either EFR or the new rate, with both types of contracts cleared within the same clearing guarantee fund.
6. CCPs no longer accept new swap contracts for clearing with EFR as PAI except for the purpose of closing out or reducing outstanding risk in legacy contracts that use EFR as PAI. Existing contracts using EFR as PAI and new contracts paying the new rate as PAI continue to exist in the same pool. Existing contracts roll off over time as they mature or are closed out. Methods for accelerating this close out, and the potential to pre-announce the closure of the CCPs' EFR-based PAI capability, may play a part.
7. Discounting within the CCPs is expected to eventually transition to the new rate. The timing of this choice will depend on each individual institution's framework, market demand, and on the establishment of sufficient liquidity in OIS and/or futures that reference the new rate.



While ARRC members believe that this basic strategy should succeed both in minimizing disruptions to existing contracts and in creating a robust source of demand for hedging in the new rate, there are a number of outstanding issues that still must be considered before a plan could be adopted. One issue identified by the ARRC is that take-up of the new rate will give rise to new basis risks, not only between the new rate and the EFRR but also between the new rate and LIBOR. Robust market structures for hedging these bases will be needed to aid in a smooth transition and to support liquidity, and will require the support of ARRC members and all major market participants. Robust basis markets would also help to facilitate the voluntary closing of legacy contracts. Mechanisms for closing out legacy contracts will need to be devised in order to both meet likely market demand and ensure the safety and soundness of the CCPs in case of a member default involving a significant legacy book. Some ARRC members have also expressed interest in exploring mechanisms to accelerate the closing of legacy contracts, but no details have yet been discussed within the ARRC, and the feasibility of mechanisms of this nature would depend on individual capabilities and interests.

In addition, there may be a need to expedite regulatory approvals for CCPs that seek to clear new OTC products referencing the new rate. Importantly, regulators will need to consider whether, and when, to require that IRS products referencing the new rate be required to be cleared. With regard to products that reference LIBOR or EFRR that currently are required to be cleared, regulators will have to consider whether there would be a need to stay existing clearing requirements at some point.

Finally, as noted in the beginning of this section, the ARRC's work so far has focused on an initial transition strategy. A paced transition would represent a first step in creating a liquid market for the alternative rate, but further work will be required – following consultation and close involvement with end users – in planning for a full transition strategy that would move a more significant portion of the derivatives markets away from LIBOR to the new rate. Although the FSB and the ARRC have mainly focused on transitioning derivatives transactions to the new rate, as noted above, in most instances these transactions are driven by the hedging needs of end users. Thus, among the issues that will be explored are whether the new rate to be chosen by the ARRC could be included in some cash products, for example, some consumer loan products where exposure to LIBOR risk may not be most appropriate, or in some types of bonds or securitizations.

## VI. Relationship with reform efforts in other currencies

Similar efforts are taking place within other currency domains. To the extent possible, the ARRC has and will continue to seek to coordinate its choices and plans with those of the other currencies.

In the **United Kingdom**, the Bank of England has convened a [Working Group on Sterling Risk-Free Reference Rates](#) to take forward the selection and implementation of an alternative reference rate for sterling markets.

Like the ARRC, the Sterling Group has preliminarily settled on two alternative rates: an overnight unsecured rate – a reformed version of SONIA that is to be produced by the Bank of England – and an overnight secured rate. The Sterling Group believes that private sector providers can produce a robust secured overnight interest rate benchmark. Two such proposals have already been presented to the Group.

Similar to the ARRC's planning thus far, the Sterling Group has determined that an alternative rate could only be a credible LIBOR alternative if it was first established as the standard rate for PAI and was the primary reference rate for the OIS discounting curve used to value swap positions. The transition plans to accomplish this would depend on the rate ultimately chosen; if reformed SONIA was chosen, then PAI and discounting may automatically switch over to the new rate, without the need of a transition plan, while if a secured rate were chosen, the Group has considered whether a “big bang” that switched PAI on both new and existing trades would be feasible.

In **Japan**, initiatives by major market participants led to the establishment of the [Study Group on Risk-Free Reference Rates](#), in order to facilitate the identification of potential alternative risk-free rate designs and administrators. Similar to the ARRC and Sterling Group, the yen Group has identified an unsecured overnight rate -- the uncollateralized overnight call rate (TONAR) produced by the Bank of Japan -- and an overnight GC repo rate as its leading candidates. The yen Group believes that the uncollateralized overnight call rate would involve fewer operational challenges given that TONAR is already referenced in OIS and a transaction-based GC repo rate does not currently exist. The group plans to identify the Japanese yen risk-free reference rate after taking into consideration the responses to its public [consultation paper](#) and also the developments in other major jurisdictions.

As discussed in the FSB report, **European** authorities already consider EONIA to be a viable and actively used nearly-credit-risk-free reference interest rate, supported by a robust governance framework. Derivatives markets based on EONIA already exist and are widely used. Authorities and market participants are also considering the development of secured reference rates. In 2013, the European Money Market Institute (EMMI) and the European Repo Council launched a Secured Benchmark Indices Joint Task Force to explore the feasibility of a transactions-based repo

benchmark. EMMI published a [consultation paper](#) seeking comments on plans to produce a transaction-based repo rate.

In **Switzerland**, the National Working Group (NWG) is the key forum for interest rate reform proposals. Alternative reference interest rates and associated transitions are being debated in the NWG. A sub-working group was tasked with evaluating whether the current unsecured tomorrow/next TOIS fixing is viable and the preferred choice in the long run. The TOIS fixing is currently used for example in Swiss franc denominated OIS contracts. A transition away from Swiss franc LIBOR is not considered. After consideration, the NWG concluded that the TOIS fixing in its current form has important weaknesses that threaten its viability. Accordingly, the NWG has turned its consideration to SARON, a transaction- and quotes-based reference rate of the overnight GC repo market in Swiss francs. The NWG and its sub-working group are now focused on transition issues from the TOIS fixing to SARON and on possible reforms for SARON. Because a large proportion of Swiss franc swaps are traded in London, the NWG has emphasized that international consistency across alternative risk-free rates would foster the development of a liquid cross currency swap market, an important consideration for Swiss market participants.

## Questions for Consultation

### Alternative Rates

- 1) The ARRC has narrowed its focus to two potential alternative rates, the Overnight Bank Funding Rate (OBFR) and an overnight Treasury general collateral repo rate. Do you have a preference between these two rates? If so, why?
- 2) Is there another potential rate that you believe should be considered by the ARRC?
- 3) With respect to an overnight Treasury general collateral repo rate, the ARRC itself has expressed a preliminary preference for a rate that included both cleared and uncleared triparty and bilateral transactions. Recognizing that no entity has committed to producing such a rate, would you prefer a repo rate that includes only triparty transactions or both triparty and bilateral? Would the inclusion or exclusion of bilateral data materially influence your preference for a repo rate as a benchmark or cause you to prefer a repo rate to the OBFR?
- 4) What concerns, if any, do you have that the alternative reference rates identified by the ARRC might be subject to manipulation if they were adopted? Are there concerns that the underlying markets, at times, could be highly concentrated or not sufficiently deep to discourage collusion? How do any concerns compare to similar concerns regarding already existing USD reference interest rates?

### Paced Transition from Effective Federal Funds Rate to the New Rate

- 5) Would the paced transition plan preliminarily outlined in the interim report lead you to seek to trade instruments and hedge risk linked to the new rate chosen by the ARRC?
- 6) Are there considerations, such as the existence of a basis market between the new rate ultimately chosen by the ARRC (new rate) and the effective fed funds rate (EFFR) that would aid in smoothing a paced transition for your firm? Are there potential disruptions that would concern you under such a plan? What are your biggest concerns relating to the paced approach outlined in this paper?
- 7) Under the paced transition plan, if markets referencing the new rate were sufficiently liquid would you:
  - a. Be willing and able to trade to convert legacy contracts referencing EFFR as the floating index in your swaps to reference the new rate, and receive/pay any transparent at-market price change, given a basis market?
  - b. Be willing to amend your CSA to reference the new rate as the interest rate for cash collateral and receive/pay any transparent at-market price change due to change in discount regime?
  - c. Be willing to migrate cleared positions that had PAI based on the EFFR to contracts that had PAI based on the new rate, assuming you would be compensated for price changes?

- 8) Could you transition only certain segments of your EFR trading? If so, which segments would be easier to transition and what share of your trading do they comprise?
- 9) If you could not transition certain segments of your trading, what would need to change to allow you to do so (external factors, internal systems, etc.)?

#### Transition from LIBOR

- 10) Could you and would you be willing to transition some or all of your derivatives trading currently referencing LIBOR into OIS or futures referencing an alternative rate chosen by the ARRC if the OIS and futures market were sufficiently liquid?
- 11) What criteria would you use to determine whether the OIS and futures markets referencing an alternative rate chosen by the ARRC were sufficiently liquid? (Bid/ask spread, price impact, trade size achievable, trade frequency, etc.?) Would you be willing to participate initially at wider bid/ask spreads and without a long history of swap volume in the new rate in order to support the transition of the market to a more robust benchmark? Are there other considerations besides liquidity that would influence your choice?
- 12) Could you transition only certain segments of your LIBOR trading and, if so, which segments would be easier to transition and what share of your trading do they comprise?
- 13) If you could not transition certain segments of your LIBOR trading, what would need to change to allow you to do so (external factors, internal systems, etc.)?
- 14) What concerns, if any, would you have to transitioning away from existing reset and payment conventions in OTC derivatives referencing LIBOR?
- 15) Do you think the paced transition would have an adverse impact on the corporate bond market, consumer loans, or securitizations? What would be needed for these types of products to reference the new rate?

#### Other Comments

- 16) Do you have any other comments, concerns or questions regarding the preliminary plans outlined in the interim report?
- 17) Are you interested in participating in a roundtable with the ARRC to further discuss the issues in this interim?

**Appendix 1.**

**Membership of the Alternative Reference Rates Committee**

**Chair**

Sandra O'Connor  
Chief Regulatory Affairs Officer  
JP Morgan Chase & Co.

**Voting Members**

Bank of America  
Barclays  
BNP Paribas  
Citigroup  
Credit Suisse  
Deutsche Bank  
Goldman Sachs  
HSBC  
JP Morgan Chase & Co.  
Morgan Stanley  
Nomura  
RBS  
Société Générale  
UBS  
Wells Fargo

**Non-voting Members**

Bank of New York Mellon  
CME  
DTCC  
ISDA  
LCH.Clearnet

**Ex Officio Members**

Board of Governors of the Federal Reserve System  
Federal Reserve Bank of New York  
U.S. Commodity Futures Trading Commission  
U.S. Treasury Department  
Office of Financial Research

## Appendix 2.

### Summary of the IOSCO *Principles for Financial Benchmarks*<sup>31</sup>

**1. Overall Responsibility of the Administrator:** The retention by the Administrator of primary responsibility for all aspects of the Benchmark determination process, such as the development and determination of a Benchmark and establishing credible and transparent governance, oversight and accountability procedures. This Principle makes clear that, regardless of the particular structure for Benchmark determination and administration, there should be an overall entity which is responsible for the integrity of the Benchmark.

**2. Oversight of Third Parties:** The adoption by the Administrator (and its oversight function) of clearly defined written arrangements setting out the roles and obligations of the parties involved in the Benchmark determination and the monitoring of any third party's compliance with those arrangements. This Principle reflects the concern that any outsourcing of functions should be subject to oversight by the Administrator. This Principle applies only where activities relating to the Benchmark determination process are undertaken by third parties, for example with respect to collection of inputs, or where a third party acts as the Calculation Agent or Publisher of the Benchmark.

**3. Conflicts of Interest for Administrators:** The documentation, implementation and enforcement of policies and procedures for the identification, disclosure, management and avoidance of conflicts of interest, including the disclosure of any material conflicts of interest to Stakeholders and any relevant Regulatory Authority. This framework should be appropriately tailored to the level of existing or potential conflicts of interest identified by the Administrator and should seek to mitigate existing or potential conflicts of interest created by the ownership or control vulnerabilities that create incentives for Benchmark manipulation.

**4. Control Framework for Administrators:** An appropriate control framework at the Administrator for the process of determining and distributing the Benchmark, which should be appropriately tailored to the materiality of the potential or existing conflicts of interest identified, and to the nature of Benchmark inputs and outputs. The control framework should be documented, available to any relevant Regulatory Authority and Published or Made Available to Stakeholders. Among other things, a control framework should include an effective whistleblowing mechanism in order to facilitate early awareness of potential misconduct.

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<sup>31</sup> International Organization of Securities Commissions (July 2013), Principles for Financial Benchmarks. <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD415.pdf>.

**5. Internal Oversight:** An oversight function to review and provide challenge on all aspects of the Benchmark determination process, which should be appropriate to the Benchmark in question (i.e., including its size, scale and complexity) and provide effective oversight of the Administrator. The oversight function and its composition should include consideration of the features and intended, expected or known usage of the Benchmark and the materiality of existing or potential conflicts of interest identified. A separate committee or other appropriate governance arrangements should carry out the oversight function.

**6. Benchmark Design:** The design of a Benchmark should take into account generic design factors that are intended to result in a reliable representation of the economic realities of the Interest that the Benchmark seeks to measure and to eliminate factors that might result in a distortion of the price, rate, index or value of that Benchmark. The factors presented are generic and non-exclusive illustrations.

**7. Data Sufficiency:** The data used to construct a Benchmark should be based on prices, rates, indices or values that have been formed by the competitive forces of supply and demand (i.e., in an active market) and be anchored by observable transactions entered into at arm's length between buyers and sellers in the market for the Interest the Benchmark measures. This Principle recognizes that *Bona Fide* observable transactions in active markets provide a level of confidence that the prices or values used as the basis of the Benchmark are credible. Principle 7 does not mean that every individual Benchmark determination must be constructed solely from transaction data. Provided that an active market exists, conditions in the market on any given day might require the Administrator to rely on different forms of data tied to observable market data as an adjunct or supplement to transactions. Depending upon the Administrator's Methodology, this could result in an individual Benchmark determination based predominantly, or exclusively, on bids and offers or extrapolations from prior transactions. Provided that an active market exists, Principle 7 does not preclude Benchmark Administrators from using executable bids or offers as a means to construct Benchmarks where anchored in an observable market consisting of *Bona Fide*, Arms-length transactions. For example, this approach might be appropriate in a market where overall transaction volume is high over sustained periods, though on any given day there might be more firm bids and offers than posted transactions taking place. The Principle also recognizes that various indices may be designed to measure or reflect the performance of a rule-based investment strategy, the volatility or behavior of an index or market or other aspects of an active market. The Principle also does not preclude the use of non-transactional data for indices that are not designed to represent transactions and where the nature of the index is such that non-transactional data is used to reflect what the index is designed to measure. For example, certain volatility indices, which are designed to measure the expected volatility of an index of securities transactions, rely on non-transactional data, but the data is derived from and thus *anchored* in an actual functioning securities or options market.

**8. Hierarchy of Data Inputs:** The establishment of clear guidelines regarding the hierarchy of data inputs and the exercise of Expert Judgment used for the determination of Benchmarks. This Principle is intended to make transparent to users the manner in which data and Expert Judgment



may be used for the construction of a Benchmark. This Principle is not intended to create a rigid checklist or otherwise restrict an Administrator's flexibility to use inputs consistent with the Administrator's approach to ensuring the quality, integrity, continuity and reliability of its Benchmark determinations, set out in the Benchmark Methodology, provided that the Data Sufficiency Principle is met.

**9. Transparency of Benchmark Determinations:** The publication with each Benchmark determination, to the extent reasonable without delaying the Administrator's publication deadline, of a concise explanation sufficient to facilitate a Subscriber's or Market Authority's ability to understand how the Benchmark determination was developed, as well as a concise explanation of the extent to which and the basis upon which judgment, if any, was used by the Administrator in establishing a benchmark determination. Benchmarks that regularly publish their Methodologies would satisfy principle 9 when derived from data sourced from Regulated Markets or Exchanges with mandatory post-trade transparency requirements. In addition, a Benchmark that is based exclusively on executable quotes as contemplated by Principle 7 would not need to explain in each determination why it has been constructed with executable bids or offers, provided there is disclosure in the Methodology.

**10. Periodic Review:** The periodic review by the Administrator of the conditions in the underlying Interest that the Benchmark measures to determine whether the Interest has undergone structural changes that might require changes to the design of the Methodology (e.g., the Interest has diminished to the extent that it can no longer function as the basis for a credible Benchmark). In order to facilitate Stakeholders' understanding of the viability of a Benchmark, a summary of such reviews should be Published or Made Available when material revisions have been made to a Benchmark, including the rationale for the revisions.

**11. Content of the Methodology:** The documentation and publication of the Methodology used to make Benchmark determinations, with sufficient detail to allow Stakeholders to understand how the Benchmark is derived and to assess its representativeness, its relevance to particular Stakeholders, and its appropriateness as a reference for financial instruments.

**12. Changes to the Methodology:** The publication of the rationale of any proposed material change in its Methodology, and procedures for making such changes. These procedures should clearly define what constitutes a material change, and the method and timing for consulting or notifying Subscribers (and other Stakeholders where appropriate, taking into account the breadth and depth of Benchmark use) of changes.

**13. Transition:** Clearly written policies and procedures that address the need for possible cessation of a Benchmark, due to market structure change, product definition changes, or any other condition, which makes the Benchmark no longer representative of its intended function. These policies and procedures should be proportionate to the estimated breadth and depth of contracts and financial instruments that reference a Benchmark and the economic and financial stability impact that might result from the cessation of the Benchmark. The Administrator should

take into account the views of Stakeholders and any relevant Regulatory and National Authorities in determining what policies and procedures are appropriate for a particular Benchmark. Administrators should encourage Subscribers and Stakeholders to have robust fallback provisions in contracts or financial instruments that reference a Benchmark.

**14. Submitter Code of Conduct** The development of guidelines for Submitters (“Submitter Code of Conduct,” which should be available to any relevant Regulatory Authorities and Published or Made Available to Stakeholders. Note: This Principle is only applicable to a Benchmark based on Submissions.

**15. Internal Controls over Data Collection:** Appropriate internal controls over the Administrator’s data collection and transmission processes – when an Administrator collects data directly from a Regulated Market, Exchange or other data aggregator, which address the process for selecting the source, collecting the data and protecting the integrity and confidentiality of the data.

**16. Complaints Procedures:** The establishment and publication of a written complaints policy by which Stakeholders may submit complaints concerning whether a specific Benchmark determination is representative of the underlying Interest it seeks to measure, application of the Methodology to a specific Benchmark determination and other Administrator decisions in relation to a Benchmark determination. This Principle is intended to promote the reliability of Benchmark determinations through Stakeholder input and alert Market Authorities to possible factors that might affect the reliability of determinations.

**17. Audits:** The appointment of an independent internal or external auditor with appropriate experience and capability to periodically review and report on the Administrator’s adherence to its stated criteria and the requirements of the Principles. The frequency of audits should be proportionate to the size and complexity of the Administrator’s operations. Under certain circumstances (i.e., appropriate to the level of existing or potential conflicts of interest identified by the Administrator) an Administrator should appoint an independent external auditor to periodically review and report on the Administrator’s adherence to its stated Methodology criteria. These provisions are intended to promote compliance with the Principles and provide confirmation to relevant Market Authorities and Stakeholders of such compliance.

**18. Audit Trail:** The retention of written records by the Administrator for five years, subject to applicable national legal or regulatory requirements. This Principle is intended to safeguard necessary documents for Audits. Additional requirements apply for Benchmarks based on Submissions.

**19. Cooperation with Regulatory Authorities:** Relevant documents, Audit Trails and other documents addressed by these Principles shall be made readily available by the relevant parties to the relevant Regulatory Authorities in carrying out their regulatory or supervisory duties and handed over promptly upon request. This is intended to facilitate a Regulatory Authority’s ability

to access information that might be needed to determine the reliability of a given Benchmark determination or to access information that might be needed to investigate misconduct.