

**Participating in International Benchmark
Interest Rate Reform and Improving
China's Benchmark Interest Rate System**

The People's Bank of China

August 31, 2020

Preface

The Fourth Plenary Session of the 19th Central Committee of the CPC proposed to improve the benchmark interest rates and market-based interest rate system. As an important pricing reference for various financial products, the benchmark interest rate is an important financial market element and core link in monetary policy transmission. Improving the benchmark interest rate system is not only the key to the construction of financial market, but also an important part of deepening the market-oriented interest rate reform, and is of great significance for improving monetary policy management and transmission mechanism.

In global financial market, the most widely used benchmark interest rate is the London Interbank Offered Rate (LIBOR). Since the global financial crisis in 2008, the unsecured interbank lending markets worldwide have significantly shrunk, which weakened reference base for LIBOR quotes. In particular, during the global financial crisis, multiple cases of LIBOR manipulation were exposed, and as a result, market credibility of LIBOR has been severely weakened. Since then, the administrators of LIBOR have launched a series of reform measures, but still unable to regain wide market recognitions. In 2017, the Financial Conduct Authority (FCA) announced that, it will no longer persuade, or compel, banks to submit to LIBOR beyond the end of 2021, which means that exit of LIBOR from the market by then becomes highly likely.

In response to the possible discontinuation of LIBOR, major developed economies are actively promoting benchmark interest rate reforms and, so far have basically concluded the selection of alternative reference rates. New benchmark interest rates selected by these economies are mostly risk-free rates (RFRs) published independently by each economy. Those rates are based on actual transactions, with a single tenor of overnight, and mostly administered by central banks. For instance, the U.S., UK, Eurozone, and Japan have identified the Secured Overnight Financing Rate (SOFR), Sterling Overnight Index Average (SONIA), Euro Short-Term Rate (€STR), and Tokyo Overnight Average Rate (TONA), respectively.

Considering the fact that new benchmark interest rates are of a single tenor of overnight, the global community is studying on constructing term rates, mainly through two methodologies. First, the backward-looking approach, that is, to refer to the overnight benchmark interest rates that have been produced to calculate their simple or compounded averages as the term rates. Second, the forward-looking approach, under which the term rates will be calculated based on relevant interest rate derivatives transactions. While a number of institutions are studying on developing forward-looking term rates, the backward-looking approach, which has a more robust transaction basis, has received more attention at present. In the meantime, relevant parties are actively promoting the application of new benchmark interest rates as well as the transition from the old benchmarks to the new ones. At the moment, transition arrangements for new and legacy derivatives contracts have been basically determined, and those for new cash products have already been released, while the transition arrangements for legacy cash products have not been clearly clarified.

Domestic banks in China also carry out foreign currency businesses referenced to USD LIBOR, etc., and now face the same problem of LIBOR transition. The People's Bank of China

(PBC) has actively participated in international benchmark interest rate reform, and guided the Self-regulatory Mechanism for Market Rate Pricing in setting up a special working group as well as carrying out a series of research. By now it has been made clear that international benchmark interest rate transitions, including LIBOR, etc., in domestic market will follow the general idea of mainly referring to international consensus and best practices, and actively promote the application of new benchmark interest rates. In accordance with that general idea, the PBC has instructed the development of the roadmap and the timetable with respect to the benchmark transitions in domestic market, organized in-depth research and instructed relevant banks to initiate preparation for benchmark transitions as soon as possible. These preparations include participating in the design and application of new benchmark interest rates, promoting benchmark transitions of new contracts, and exploring the benchmark transition arrangements for the legacy contracts.

Although China started late, compared internationally, in building benchmark interest rate system, we have the obvious first-mover advantage in cultivating benchmark interest rates based on actual transactions. Since the establishment of China interbank market, we have already cultivated benchmark interest rates based on actual transactions such as bond repo rates, which have shown a certain level of benchmarking and credibility and have been in operation for over two decades. After years of continuous cultivation, by now significant progress has been made in the construction of China's benchmark interest rate system. Money market, bond market, loan market, etc., have basically cultivated their own representative interest rate indicators. Depository-Institutions Repo Rate (DR), government bond yield, Loan Prime Rate (LPR), etc., have played a significant role as benchmark interest rates in corresponding financial market, providing relatively good reference in observing market operation and guiding financial product pricing.

Overall, China's benchmark interest rates based on actual transactions have been in operation for a long time, and China possesses full-scale market transaction data with transparency and availability. In addition, the PBC consistently attaches great importance on the regulatory management of benchmark interest rates. These features have established solid foundation for the construction of China's benchmark interest rates, and are conducive to ensuring the credibility, authority and market recognition of each benchmark interest rate.

As the market-oriented interest rate reform further advanced, a sounder benchmark interest rate system is required. Therefore, the PBC has made in-depth research and, proposed ideas and plans on improving China's benchmark interest rates and the market-based interest rate system with the focus on DR. Next, the development priority of China's interbank benchmark interest rate system is to promote wide application of various benchmark interest rates. Efforts will be made in innovating and broadening the application of DR in financial products, including floating-rate bonds and floating-rate interbank certificate of deposits (CDs), etc., so as to make DR a key reference indicator for China's monetary policy management and financial market pricing.

In order to give a comprehensive introduction to China's progress and plan to participate in international benchmark interest rate reform, to summarize current development of China's benchmark interest rate system, and to study and further promote the soundness of the benchmark interest rate system, the PBC hereby publishes this White Paper.

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1. Progress on International Benchmark Interest Rate Reforms and China's Preparations

1.1. Progress on International Benchmark Interest Rate Reforms

1.1.1. Identification of Alternative Reference Rates Has Basically Concluded

To avoid repeating the LIBOR manipulation scandal, under the promotion of the Financial Stability Board (FSB), regulatory authorities around the world conducted in-depth reforms on LIBOR and other Interbank Offered Rates (IBOR). Reformed LIBOR, however, is still unable to regain market recognition. As a result, the Financial Conduct Authority (FCA) decided not to persuade, or compel, banks to submit to LIBOR, and in turn, to construct new benchmark interest rates based on actual transactions. Subsequently, major economies including the U.S., Eurozone, Japan, and Switzerland all conducted research on discontinuing LIBOR and developing alternative benchmark interest rates.

So far major developed economies have basically completed identification of alternative reference rates, and the emerging economies, such as Mexico and Brazil, are also following the practice of developed economies to launch new benchmark interest rates. In general, those economies have selected RFRs as the alternative of IBOR benchmark interest rates. These alternative benchmark interest rates are generated based on actual transactions. In order to ensure a stable trading basis, there is only one single tenor of overnight. The sample of trading participants is also relatively wide, and most of the RFRs are directly supervised and managed by the central bank, so as to enhance their benchmarking and credibility.

Major economies followed two paths in promoting the benchmark interest rate reforms. One is to completely replace IBOR benchmark interest rates with RFRs, such as the U.S. and UK. The other is to reform the existing IBOR quote mechanism, while introducing RFRs, to improve the reliability of IBOR quotes, and to allow the coexistence of several benchmark interest rates, such as Eurozone and Japan.

1.1.1.1. Complete Replacement Mode: the U.S. and UK

The U.S. is replacing USD LIBOR with Secured Overnight Financing Rate (SOFR). SOFR is a new benchmark interest rate jointly prepared by the Federal Reserve Bank of New York (FRBNY) and Office of Financial Research (OFR). It was officially launched in April 2018 and is now directly administered by FRBNY. SOFR is generated based on overnight treasury bond repo transactions with an average trading base of more than \$1 trillion daily. UK identified reformed Sterling Overnight Index Average (SONIA) to replace GBP LIBOR. SONIA is based on unsecured sterling overnight lending transactions and was first introduced in 1997. The Bank of England (BOE) has further improved SONIA's calculation rules and expanded SONIA's trading base. The average daily trading volume has increased by four to five times, reaching about £50 billion. In 2017, the Bank of England announced SONIA as the alternative benchmark interest rate for the GBP LIBOR.

1.1.1.2. Coexistence of Several Benchmark Interest Rates Mode: Eurozone and Japan

The Eurozone introduced €STR. The €STR, which is based on the euro unsecured overnight lending market and represents the large banks' financing interest rate, has been officially put into operation in October 2019. Meanwhile, Euro Interbank Offered Rate (EURIBOR) will coexist with €STR, and the Eurozone introduced the 'waterfall methodology'¹ to reform EURIBOR and improve the reliability of quotes. Japan has similar situations with the Eurozone. On the one hand, they identified Tokyo Overnight Average Rate (TONA) as RFR. On the other hand, they retained Tokyo Interbank Offered Rate (TIBOR), and adopted a similar waterfall methodology with that of EURIBOR.

1.1.2. Exploring the Construction Methods of Term Rates

One of the major challenges in international benchmark interest rate reform is to develop term rates. The RFRs that will replace LIBOR are overnight rates, but market participants still need term rates for reference, so it is also necessary to construct term rates based on overnight benchmark interest rates. Major methodologies proposed by Alternative Reference Rates Committee (ARRC) and other benchmark working groups include the backward-looking approach and the forward-looking approach.

1.1.2.1. Backward-Looking Approach

The backward-looking approach is to use the compound or simple average of RFRs that have been realized in the past period of time. The term rate constructed by this approach is actually the simple interest or compound interest value of historical data of RFRs. The backward-looking approach has the following advantages: First, it is simple, intuitive and highly operable. Second, in arrears structure may reflect the actual movements of interest rates during the interest period. Third, taking simple average or compound average calculation may smooth the fluctuation of RFRs at individual time points. In backward looking methodology, users may choose from in advance or in arrears structure, representing data collection backwards from the start or the end of the interest rate period.

However, there are certain deficiencies no matter which structure is adopted. If the in advance structure is adopted, that is, the interest rate value is calculated according to the past RFRs at the beginning of the interest period, the data collection period is inconsistent with the interest period, and the actual interest rate in the interest period cannot be fairly reflected. If the in arrears structure is adopted, that is, the term rate is calculated according to the interest period's actual RFRs at the end of the interest period, it would result in a relatively late determination of interest rate, which will adversely affect market participants' liquidity management and expenditure budget management.

1.1.2.2. Forward-Looking Approach

Forward-looking approach will be based on RFRs derivatives including overnight indexed swaps (OIS) or futures, which in general reflects market expectations of the average value of RFRs in the future. The advantage of forward-looking approach is that the interest rate can be determined at the

¹ Waterfall Methodology is to submit quotes primarily based on actual transactions, while may also refer to expert judgements to make submissions in case the underlying transaction volume fails to meet certain requirements.

beginning of the interest period, which is consistent with the general market practice. But the problem is that a highly liquid RFRs derivatives market and additional regulatory arrangements are needed to ensure the fairness and credibility of forward-looking term rates. Enterprises and individuals who will use this approach should also have more financial knowledge to understand RFRs derivatives and the forward-looking mechanism.

At the moment, the international regulatory organizations including FSB and the national benchmark working groups such as ARRC showed a preference in backward-looking approach. The main reasons: First, the underlying transaction volume of backward-looking rate is significantly higher. At present, the average daily transactions underlying SOFR is more than \$1 trillion, which is much higher than that of SOFR derivatives. Second, the backward-looking approach is more consistent with the calculation mechanism of OIS contracts, which will be more convenient for hedging purposes. Third, the recommended forward-looking term rate is yet to be determined, but the backward-looking rate can be used immediately. Therefore, in absence of special needs, the backward-looking approach is highly likely to be the mainstream.

Progress has been made in constructing term rates based on RFRs. The FRBNY has already begun publishing 30-day, 90-day and 180-day SOFR compound average in arrears rates since the first quarter of 2020. In order to accommodate the preferences of LIBOR users to determine the interest rate in advance, some private benchmark administrators in the U.S. are also exploring the construction of forward-looking SOFR term rates. ARRC intends to select and recommend a forward-looking SOFR term rate by the end of 2021 if a consensus among its members can be reached that a robust benchmark exists and meets appropriate criteria set by the ARRC.

1.1.3. Actively Promoting Benchmark Interest Rate Transitions

Another major challenge in international benchmark interest rate reform is promoting the transition of financial contracts that reference LIBOR to new benchmark interest rates. The FSB has requested the International Swaps and Derivatives Association (ISDA) to work on the enhancement of the contractual robustness of LIBOR derivatives, while national benchmark working groups are responsible for the benchmark transition of LIBOR cash products.

1.1.3.1. ISDA Has Basically Concluded the Benchmark Transition Plans for LIBOR Derivatives

After multiple rounds of consultations, ISDA has almost concluded the benchmark transition arrangements of LIBOR derivatives. The latest developments suggest that the key parameters include. (1) Fallback Rate. RFRs of relevant currencies will be used as the primary fallback rate of LIBOR. (2) Spread Adjustment. To account for the difference between LIBOR and RFRs, a compound setting in arrears structure will be used to account for the term premium, and a historical median spread adjustment over a five-year look-back period will be implemented to account for the credit spread. (3) Trigger Event. ISDA identifies permanent cessation and pre-cessation triggers for benchmark transitions. In the case of permanent cessation, a fallback trigger event occurs when

there's a public statement or publication of information by or on behalf of the benchmark administrator or the regulatory authorities of the benchmark administrator announcing that such administrator has ceased or will cease to provide the benchmark, permanently or indefinitely, provided that, at the time of such statement or publication, there is no successor administrator that will continue to provide the benchmark. In the case of pre-cessation, a fallback trigger event occurs when there's a public statement or publication of information by the regulatory supervisor for the benchmark administrator announcing that the benchmark is no longer representative. (4) Timing of Transition. It will be the official date of LIBOR discontinuation stated in the relevant public statement, or the date of the public statement by regulatory authorities announcing that LIBOR is no longer representative. (5) Scope of Use. New and legacy derivatives contracts will be treated separately. Amendments to 2006 ISDA Definitions will apply to new derivatives contracts, and a multilateral ISDA 2020 Fallbacks Protocol will be incorporated to legacy contracts.

1.1.3.2. The U.S. Has Drawn Up Transition Plans for New Cash Products

The cash products benchmark transitions in the U.S. have made rapid progress. The ARRC has recommended fallback provisions for new issuance of LIBOR floating rate notes, bilateral business loans, syndicated loans, adjustable rate mortgages, and securitizations. In the case of floating rate notes, for example, First, the fallback rate and spread adjustment will be determined using a waterfall methodology. In terms of the fallback rate, the forward-looking term SOFR recommended by the official sector will be the first choice, followed by the compounded SOFR in arrears. Considering that SOFR may also be no longer available in the future, arrangements have been made accordingly in lower waterfall levels. In terms of spread adjustment, the official recommended spread is preferred, followed by the ISDA spread adjustment, and the spread specified by the issuer sits at the bottom of the waterfall methodology. Second, the fallback trigger event and timing of transition are generally aligned with the fallbacks for derivatives, which help reduce basis risk between cash products and derivatives. Third, the scope of use. Current fallback provisions proposed by the ARRC are applicable to new cash products contracts. Fallback arrangements of legacy contracts are still under examination and have not yet been clarified.

1.1.3.3. International Accounting Standards Board (IASB) Revised the Accounting Standards

In April 2020, the IASB published an exposure draft of *Interest Rate Benchmark Reform — Phase 2*, proposing amendments to relevant international financial reporting standards based on recent benchmark reform developments. The changes proposed intend to clarify the modifications of financial assets and liabilities; amendments to hedging relationships, accounting for qualifying hedging relationships and groups of items; designation of risk components and portions; and disclosure requirements. At the same time, the draft proposed that the amendments would be set after January 1, 2021 and enterprises should be allowed to use the revised accounting standards in advance.

1.1.3.4. International Organizations Promote International Coordination

Recent years, international economic and financial organizations, including the G20 Finance Ministers and Central Bank Governors Meeting, Bank for International Settlements (BIS) Market Committee (MC), FSB, Basel Committee on Banking Supervision (BCBS), conducted international coordination with respect to benchmark interest rate reforms. China actively participates in international coordination as one of the members. The January 2019 MC meeting suggests that the national regulatory authorities of each economy devise transition strategies, develop term rates, and enhance cross-market and cross-economy coordination. The December 2019 FSB meeting agreed to adopt RFRs to replace IBOR. The February 2020 BCBS meeting stressed that the banks should invest enough attentions and resources on the evaluations of the impact of the benchmark reform on its business. The July 2020 G20 Finance Ministers and Central Bank Governor Meeting reaffirmed that international benchmark transitions should be conducted as scheduled, promoting the scheduled LIBOR cessation before the end of 2021.

1.2. China's Preparation for International Benchmark Interest Rate Reform

With the acceleration of economic globalization and China's opening-up, domestic banks in China also bear a certain amount of foreign currency exposures, some of which are priced with reference to foreign currency benchmark interest rates including LIBOR. Under the guidance and promotion of the PBC, relevant parties enhance overall coordination and actively participate in the far-reaching international benchmark interest rate reform. After in-depth studies, wide discussions, and extensive consultations, China will refer to international consensus and best practices to promote the domestic transition of international benchmark interest rates with lower cost and higher efficiency in an orderly manner.

1.2.1. The PBC Makes Overall Plans for Relevant Work on International Benchmark Interest Rate Reform

1.2.1.1. Providing China's Experience to International Benchmark Interest Rate Transitions

The PBC actively participates in international conferences and keeps close contact with international organizations and central banks of major economies, introducing relevant situations about China's participations in international benchmark interest rate reform, proposing ideas and suggestions on international benchmark interest rate reform plans, and communicating the practices in the construction of benchmark interest rate system and the promotion of LPR reform in domestic market, providing experiences and references to international benchmark interest rate reform.

1.2.1.2. Setting up a Special Working Group to Promote International Benchmark Transitions in Domestic Market

Under the overall guidance of the PBC, the Self-regulatory Mechanism for Market Rate Pricing held a working conference in September 2019 and decided to establish an international benchmark interest rate reform working group (hereinafter referred to as LIBOR Working Group). The Bank of China (BOC) serves as the group leader. China Development Bank (CDB) and the Export-Import

Bank of China (CEXIM) serve as the deputies. Group members include 15 major national banks such as Industrial and Commercial Bank of China (ICBC), etc. The LIBOR Working Group overall researches on all kinds of work about international benchmark interest rates transition in domestic market.

Hold regular LIBOR Working Group meetings. The PBC has organized and guided the LIBOR Working Group to hold regular group meetings to share the latest up dates with respect to the international benchmark interest rate reform as well as the internal working progress of each member with respect to benchmark transitions. Group meetings also studied ideas and draft plans of international benchmark transitions in domestic market, discussed and reviewed research reports submitted by the members, invited relevant international regulatory agencies and international counterparts to introduce the considerations and solutions of benchmark interest rate reform. As of August 2020, the LIBOR working group has held five working meetings.

Actively conduct research and studies on international benchmark interest rate reform. The LIBOR Working Group has made a clear division of research. BOC is responsible for the research on transitions of bonds and derivatives referencing LIBOR; ICBC and CEXIM are jointly responsible for research on benchmark transitions of deposit and loan products referencing LIBOR; CDB is responsible for closely monitoring the latest updates, progress and experiences on international benchmark interest rate reform. At present, the research work has been carrying out in an orderly manner. The research achievements will be shared with relevant institutions after deliberations of LIBOR Working Group, in order to promote the benchmark transitions in an orderly and effective manner.

Closely monitor domestic LIBOR exposures. PBC has guided the Self-regulatory Mechanism for Market Rate Pricing to design a standardized data template and to develop a quarterly reporting mechanism among the group members, in order to closely monitor LIBOR exposures of major domestic banks at a regular basis, and to evaluate the impact of LIBOR cessation on domestic banks. Overall, LIBOR exposure of domestic banks is on a relatively small scale with short durations and high concentrations. As a result, LIBOR cessation has a limited impact, and the accompanying risk is under good control. By the end of the second quarter of 2020, 15 major banks have \$900 billion of LIBOR exposure that will mature after the end of 2021.

Invite foreign banks to share reform experience. The PBC has guided the Self-regulatory Mechanism for Market Rate Pricing to hold a LIBOR Working Group training session, and invited experts from foreign banks including Standard Chartered Bank and Citibank to introduce and discuss the latest progress and related practice with respect to international benchmark interest rate reform with the members of LIBOR Working Group. According to the experts, major international banks have reached a partial consensus on matters of benchmark interest rate reform. It is expected that the second half of 2020 and 2021 will be very crucial as during this period, many technical details of benchmark transitions will be determined and finalized.

1.2.2. Domestic Banks Actively Conduct Internal Relevant Work

1.2.2.1. Setting up High-Level Working Groups

At present, major banks have set up special working groups on the reform of international benchmark interest rates, which is usually chaired by senior executive vice presidents of the bank, led by the department of asset and liability management, with the participation of relevant departments such as financial market, risk management, financial accounting and IT system, etc., so as to clarify the coordination mechanism and give full play to their professional advantages to participate in coping with the reform of international benchmark interest rates. Banks with a wide network of overseas branches have also set up teams both domestically and overseas working in collaboration on LIBOR transitions. These banks also implemented a regional responsibility system for overseas branches, held regular contact meetings, and closely followed the transition progress of benchmark interest rates in their regional market respectively.

1.2.2.2. Assessing the Impact of LIBOR Cessation and Compile Transition Guidelines

Major banks have made a comprehensive assessment of the impact of LIBOR cessation from risk exposure identification, contract languages, business strategies, valuations and models, internal system construction, financial accountings and other aspects, and have formulated LIBOR transition guidelines and other internal documents to standardize and guide various internal works on LIBOR transitions.

1.2.2.3. Drawing Experiences from International Counterparts

Consulting companies and international counterparts were invited to introduce the latest advancements on international benchmark interest rate reform, especially the advanced experiences and specific practices of international counterparts in coping with benchmark transitions, so as to provide reference for domestic banks to carry out transitions of international benchmark interest rates.

1.3. China's Roadmap and Timetable for International Benchmark Transitions

Based on the general idea of drawing on international consensus and best practices, China will, in line with the progress of the reform of international benchmark interest rates, simultaneously promote the design and application of new benchmark contracts and the transition of benchmark interest rates of legacy LIBOR contracts, so as to promote the transition of international benchmark interest rates in a steady and orderly manner.

1.3.1. Promoting the Design and Application of New Benchmark Interest Rates

1.3.1.1. Research on New Benchmark Interest Rate RFRs Calculation Methodologies

To promote the adoption of RFRs in cash and derivative contracts, the PBC has organized LIBOR Working Group, based on international experiences, to conduct in-depth discussion on term rate calculation algorithm, interest accruing method, interest payment scheme and relevant rules, and to

study the application plans and recommendation scenarios of difference methodologies. LIBOR Working Group will, after the methodologies have been determined, publicize and advertise the results in the future, aiming to promote a relatively consistent application convention.

1.3.1.2. Encouraging Banks to Initiate Preparations for the Application of New Benchmark Interest Rate As Soon As Possible

Due to the fact that a complete consensus of new benchmark interest rate market conventions has not been reached in the global community, in accordance with the principle of ‘early planning, early scheduling, and early implementation’, the PBC has been actively encouraging domestic banks to closely monitor the global dynamics, meanwhile initiate system improvement, contract language revision and other works as soon as possible, and set up multiple possible options for the calculation conventions of the new benchmark interest rates, setting aside space to adapt to the future uncertainty.

1.3.1.3. Guiding Banks to Launch Products Referencing New Benchmark Interest Rates

Organize banks to launch trial issuance of financial products referencing RFRs. BOC has issued SOFR-based debt instruments in the U.S. onshore market in 2019, invested in SOFR-based notes, and issued SOFR-based, US dollar-denominated floating-rate bonds in the international offshore bond market. In April 2020, China Foreign Exchange Trade System & National Interbank Funding Center (CFETS) launched new derivatives products referencing new benchmark interest rate, and some banks have already participated in the cross-currency swap (CCS) and foreign currency interest rate swap (IRS) transactions referenced to SOFR and other foreign currency interest rates, so as to explore and expand the application of RFRs in relevant financial products.

1.3.2. Exploring Benchmark Transitions for New Contracts

1.3.2.1. Studying and Formulating Fallback Languages for New Contracts

Given that the new benchmark interest rates have not been widely adopted, there are still many new contracts referencing LIBOR. It is urgent to clarify the fallback languages for new contracts, to facilitate the future benchmark interest rate transitions to new benchmark interest rates when LIBOR phases out. The PBC will instruct the LIBOR Working Group, with reference to international experiences, to provide clarifications on elements of fallback arrangements including triggers, benchmark transition dates, alternative benchmark interest rates, spread adjustment, interest accruing method and relevant market conventions. PBC will also urge National Association of Financial Market Institutional Investors (NAFMII) to revise relevant derivatives agreements and definitions as soon as possible.

1.3.2.2. Publishing the Benchmark Transition Plan for New Contracts in Due Course

After the benchmark transition plan for new contract have been determined and finalized, the PBC will instruct the LIBOR Working Group to publish the recommended fallback languages, providing

guidance to financial institutions to formulate their own customized transition plans accordingly.

1.3.2.3. Coordinating the Promotion of Domestic Benchmark Interest Rate Transitions

Banks and their clients' recognition and understanding of the original and new benchmark interest rates can have significant impact on transition progress. The PBC will instruct the LIBOR Working Group and major banks to conduct policy explanation and client education in a variety of channels, to insure an orderly benchmark transition in domestic market.

1.3.3. Research on the Benchmark Transition Plan for Legacy Contracts

1.3.3.1. Closely Following up the Global Transition Progress of Legacy Contracts

As the international community has not yet formulated a complete transition plan for legacy contracts, China will closely follow up the global dynamics, refer to the advanced experiences, and research on launching benchmark transitions plans for various legacy contracts in domestic market.

1.3.3.2. Guiding Banks in Gradual Cessation of New Use of LIBOR

Regulators in the U.S. and the UK have clearly required financial institutions to successively stop entering all kinds of LIBOR-based products in 2021. Furthermore, the British regulators advised financial institutions to offer non-LIBOR loan products since the fourth quarter of 2020. The PBC will also urge domestic financial institutions to discontinue the new issuance of LIBOR-based products according to the benchmark interest rate transition progress domestically.

1.3.3.3. Organizing Banks to Conduct Benchmark Transitions with Respect to Legacy Contracts

The PBC will, when the relevant transition plans and supporting measures are put in place, instruct the LIBOR Working Group to urge financial institutions to implement transition requirements as soon as possible and reach supplemental agreements with clients to implement benchmark transitions for the legacy contracts.

1.3.4. Conducting On-going Monitoring and Research

1.3.4.1. Closely Following Up the Progress of International Benchmark Interest Rate Reform

Closely follow up the reform updates on RFRs application, contract design, transition plans for new and legacy contracts, term rate developments and spread adjustment methodologies, providing important reference for international benchmark interest rate transitions in domestic market.

1.3.4.2. Monitoring Domestic LIBOR Exposure on a Regular Basis

Continue to monitor domestic LIBOR exposure on a quarterly basis and make dynamic assessment of the impact of LIBOR discontinuation. Closely follow up the signing of fallback items of new LIBOR-based contract, outstanding contract transition progress and other situations once the transition plans have been determined, hence mastering the overall picture of the domestic benchmark transition progress.

2. Current Status and Prospects of China's Benchmark Interest Rate System

In the process of improving the socialist market economic system and advancing the market-based interest rate reform, China attaches great importance to building the benchmark interest rate system. After years of continuous efforts, China's money market, bond market, credit market, and derivatives market have respectively cultivated its own benchmark interest rates with certain credibility, authority, and market recognition, and they have played an important role in observing market operations and guiding financial product pricing. In particular, as for building benchmark interest rates based on actual transactions, in obvious contrast to other economies who had just paid close attention to during recent benchmark interest rate reform, China has cultivated a series of benchmark interest rates based on actual transactions since the establishment of domestic interbank market, which provides outstanding first-mover advantages.

2.1. Important Progress Has Been Made in the Construction of China's Benchmark Interest Rate System

2.1.1. Repo Rate System Based on Actual Transactions

Repo market is the major component of China's money market, with interbank pledged repurchase enjoys the largest market share. At present, China has already established benchmark interest rate system based on interbank pledged repo transactions, mainly including key benchmark interest rates such as R, DR, FR, and FDR. At the same time, benchmarks such as GC have also been developed based on exchange-traded repo transactions.

2.1.1.1. Repo Rate (R)

CFETS began to calculate and publish repo rate with 11 maturities including overnight (R001), 7 days (R007), etc., since the establishment of a unified national interbank bond market in 1997, when bond pledged repo transactions began trading in CFETS. Those rates have been in operation for more than 20 years until now. Participants include all entities participating in interbank market transactions, without distinguishing pledges, reflecting the liquidity of the entire interbank market. In recent years, with the continuous development of China's interbank market, the average annual compound growth rate of pledged repo transaction volume is about 30%. Since 2020, the average daily transaction volume is about 3.9 trillion Yuan, higher than the market base of RFRs based on actual transactions such as SONIA and €STR, and close to the market base of SOFR. It ensures the effectiveness and benchmarking of China's benchmark repo rate system.

2.1.1.2. Depository-Institutions Repo Rate (DR)

After 2014, China's interbank business and asset management business have developed rapidly, and interbank market participants have continued to increase. A liquidity transmission hierarchy from central bank to major banks, then to small and medium-sized banks, and ultimately to nonbanking financial institutions has formed. In particular, increasing transactions of non-bank financial institutions have made the interest rate fluctuations much more easily affected by counterparties and pledges. In order to truly, accurately reflect the liquidity condition of the banking system, as well as reduce the disturbance to interest rate pricing from the credit risks of trading participants and the quality of the collaterals, CFETS started to develop DR since December 2014 under the guidance of the PBC. DR is the weighted average interest rate of interest rate bond pledged repo transactions conducted among depository financial institutions. It covers 11 tenors from DR001 to DR1Y. Since 2020, the daily trading base for DR has exceeded 1.8 trillion Yuan, which accounts for 48 percent of the interbank repo market. DR has become a barometer of the liquidity tightness of the banking system, has had a profound influence on the observation behavior of market liquidity, and has created a favorable condition for the fine pricing of money market transactions.

2.1.1.3. Fixing Repo Rate (FR, FDR)

Under the guidance of the PBC, CFETS launched interbank Fixing Repo Rate (FR) in March 2006. Based on the pledged repo transactions from 9:00 to 11:00 AM every trading day, the median rate was taken as fixing repo rate from all transaction rates after tight ordering and released at 11:00 AM. In order to adapt to the changes in market structure and improve the FR benchmarking, CFETS optimized FR formation mechanism by extending sampling and release time to 11:30 AM and replacing tight ordering with normal ordering. Since the initial launch, FR has not only been an important pricing reference for fund transactions such as repo business, but also been widely used in the derivatives market such as IRS and forward interest rate agreements (FRA). Currently, in China IRS transactions with FR007 as underlying rate account for about 80%.

In May 2017, CFETS launched the Fixing Depository-institutions Repo Rate (FDR) based on DR, and took the median of DR in a form similar to FR to effectively eliminate abnormal prices and reflect the market condition more accurately. IRS products with FDR as the underlying rate were launched simultaneously.

2.1.1.4. General Collateral Repo Rate (GC)

The exchange-traded general collateral repo business was launched in 2006. Due to the rapid development of asset management business and other factors, the exchange repo trading volume has increased rapidly in recent years, with the average daily trading volume reaching 1 trillion Yuan. The participants of exchange repo market are mainly non-bank financial institutions and products, most of which are short-term funds. In addition, due to a close relation with the fluctuation of the stock market, the volatility of exchange repo rate represented by GC is generally higher than interbank repo rate.

2.1.2. Interbank Lending Market Rate

2.1.2.1. China Interbank Offered Rate (CHIBOR)

A unified national interbank funding network was established in China in January 1996. In June that year, interbank lending rate was deregulated. From there, CHIBOR was up and running and published every day. CHIBOR was calculated by taking a weighted average of lending rates, with the trading volume being the weights, over eight tenors, from overnight to 120 days. It is the first market-based interest rate indicator in China. In the early stage of the establishment of the lending market, transactions were not active and the interest rates fluctuated greatly, which affected the representativeness and benchmarking of CHIBOR, and its application scope was also limited. With the preparation of benchmark interest rates such as SHIBOR, CHIBOR has gradually faded out of the market.

2.1.2.2. Shanghai Interbank Offered Rate (SHIBOR)

In January 2007, Shanghai Interbank Offered Rate (SHIBOR) was formally introduced under the direction of PBC, with CFETS being the designated publisher. SHIBOR shares a formation mechanism similar with that of LIBOR, i.e., it is based on the quote mechanism. At 11:00 AM each business day, SHIBOR will be calculated and published after arithmetically averaging all the quotes of the 18 quoting banks, with the highest and lowest quotes excluded. After the establishment of SHIBOR, PBC pays high attention to the administration and supervision of the quotes, including introducing an evaluation mechanism on the quality of the quotes, emphasizing the obligations of quoting banks to complete actual transactions with the quoted price, performing evaluations on a regular basis, and implementing a last-place elimination scheme, so that the incentive mechanism can play an effective role, and the possibility of quote manipulation can be effectively eliminated.

Ten years after its introduction and due to careful cultivation, the short end of SHIBOR can effectively reflect liquidity levels in the money market and is closely linked to transaction-based interest rates. By now, the overnight SHIBOR rate has a 99 percent correlation with DR001, while 1-week SHIBOR has a 95 percent correlation with DR007. Furthermore, the quote mechanism will ensure the sound term structure of SHIBOR, providing pricing benchmark to medium-to-long term financial instruments. One thing worth mentioning is that, benefiting from the development of the interbank certificate of deposit (CD) market, the benchmark features of the medium- and long-term SHIBOR have also substantially improved, as the 3-month SHIBOR rate exhibits a high correlation of 90 percent with the 3-month CD issuance rates.

SHIBOR developments, however, are also facing a few issues. First, similar with that of LIBOR, quote-based formation mechanism creates inevitable differences between SHIBOR and transaction-based rates. And due to the relatively slow development of domestic unsecured lending market as compared to the repo market, its support to SHIBOR has been weakened. Second, the application scope of SHIBOR is still limited, and SHIBOR is mainly used for: floating-rate interbank CDs, but the issuance volume is limited to 8.5 billion Yuan of 10 issuances of CDs in 2019, with the market share of only 0.05 percent; IRS, trading volume of SHIBOR-based IRS accounted for around 26

percent of the whole IRS market; funds transfer pricing (FTP) reference of SHIBOR quoting banks; the underlying asset of structural deposits; wealth management products, asset-based securitization (ABS), and corporate bonds, but only with a very small presence, respectively.

2.1.3. Yields for Government Bonds and Policy Financial Bonds

Government bond yield and policy financial bond yield are the primary benchmark interest rates in China's bond market. Both yield curves are published by the China Central Depository & Clearing Corporation (CCDC) and CFETS. Government bond yield and policy financial bond yield are frequently used by financial institutions when observing interest rate changes in medium- and long-term bond market. As the banking sector is the predominant component of China's financial system, the government bond market and the policy financial bond market are much smaller than the credit market, and as a result, the influence of government bond yield and policy financial bond yield are relatively limited.

2.1.4. Interest Rate Swap Curves

China began to launch several interest rate derivatives since 2005. Among them, the IRS market is well-developed, and the average daily turnover is close to 100 billion Yuan. Based on the IRS market, CFETS launched the IRS curves in 2012 as reference for the pricing and valuation of IRS participants. In September 2019, CFETS further launched the LPR IRS curve in line with the reform of the LPR formation mechanism. By the end of 2019, CFETS has overall published IRS curves for 16 reference underlying subjects, with the longest tenor up to 10 years. These curves are calculated according to the information such as the tradable quotes quoted by the IRS quoting institutions, and are classified into fixing curves and closing curves, published on a daily basis. The development of IRS market, the compilation and use of swap curves, enriched the interest rate risk management instruments of the interbank market participants. IRS hedges have become an important part of the investment and risk management strategy for the market institutions, improved the price discovery function of IRS market.

2.1.5. Loan Prime Rate (LPR)

The banking sector is the predominant component of China's financial system, with loans being the most frequently used financing instruments. Thus, interest rate of loans is the key component in China's benchmark interest rate system. For a very long period, domestic loans were priced mostly on the basis of benchmark loan rate set by PBC. As the benchmark loan rate demonstrated administrative feature, some banks, while issuing loans, even set implicit floor rates at 90 percent of the benchmark loan rate through concerted practices, impeding the effectiveness of interest rate transmission. In October 2013, PBC organized the launch of the original version of LPR as the market-based benchmarks for loans. But the quoting banks submitted LPR quotes mainly based on benchmark loan rate, resulted in the low level of marketization of old LPR, and its limited application scope.

In line with the arrangements of the State Council, on August 17, 2019, the PBC released an

announcement on reforming and improving the LPR formation mechanism. Under the new formation mechanism, quoting banks are required to make quotes of the lending rates applied to their own prime clients, by adding a few basis points to the interest rate of open market operations, which mainly refers to the medium-term lending facility (MLF) rate. At present, the LPR consists of rates with two maturities, i.e. one year and over-five-year. And the LPR quoting banks are comprised of 18 banks. The quoting banks will submit their quotes before 9:00 AM on the 20th day of every month (postponed in case of holidays), with 0.05 percentage points as step length, to CFETS. CFETS will calculate the arithmetic average of rates after excluding the highest and lowest ones and find its nearest integral multiple of 0.05% to be the LPR, which will then be published at 9:30 AM on the same day.

Since its debut in August 2019, the new LPR has gradually dropped, and become more market oriented, preferably reflecting the monetary policy stance and the change of market supply and demand. As of July 2020, one-year and over-five-year LPRs accumulatively fell by 0.4 and 0.2 percentage points respectively. Financial institutions actively use LPR as the pricing reference. By now, new loans are basically priced with LPR, and the replacement of the pricing benchmark of existing bank loans with LPR has launched as scheduled in March 2020, and has been finished at the end of August 2020. With the effects of the LPR reform further realized, implicit floor on loan rates was completely removed, the efficiency of the transmission from market interest rates to lending rates has substantially increased, pushing down the lending rates significantly. By July 2020, the weighted average interest rate on enterprise loans reached 4.68%, decreasing 0.64 percentage points year on year, significantly exceeding that of the LPR in the same period. All of these have shown that, LPR reform has strengthened financial institutions' pricing ability, enhanced the competitiveness of loan market, and brought down the lending rates.

2.2. First-Mover Advantage and Experience in the Development of China's Benchmark Interest Rate System

2.2.1. Transaction-Based Benchmark Interest Rates Have Been in Operation for a Long Time

Currently, the global community is focusing on developing risk-free rates based on real transactions. However, since the establishment of the unified interbank lending market and bond market in 1996 and 1997 respectively, China has long been developing and publishing transaction-based lending rates and repo rates for over two decades. In particular, the DR rates, which the PBC has stepped up efforts to cultivate in recent years, have now become the most important indicator to observe market-based interest rates. Specifically, DR only includes repo trades that are among interbank deposit-taking financial institutions and collateralized by interest rate bonds, effectively eliminating the interference of credit ratings of trading counterparties and collaterals. Under such approach, DR is in essence very close to the new benchmark interest rate RFRs which are developed worldwide. In a way, China has been the front-runner in the development of transaction-based risk-free rates.

2.2.2. Possessing Full-Scale Market Transaction Data with Transparency and Availability

For a long time, the benchmark interest rate reforms in the U.S., Eurozone and other economies have been challenging as relevant regulators cannot have access to full-scale transaction data and key market statistics, such as LIBOR-based risk exposure, due to a series of widespread issues including market fragmentation, decentralization of information and low transparency. In contrast, China has all kinds of transaction data that is in full-scale with accuracy, long time-series, ample information and transparency. For example, all transactions in China's interbank market are conducted on the trading system of CFETS. Under robust regulation and organized operation, China's over-the-counter (OTC) market is not facing fragmentation, low transparency, and other disadvantages, but benefits from market flexibility and trading efficiency. Meanwhile, such market is well-suited to calculate and publish market-based transaction rates, such as DR and R, reflect market funding levels in an accurate, effective and timely manner, and ensure the representative and benchmarking features of market-based benchmark interest rates. This is another unique advantage of China in construction of market-based benchmark interest rate system.

2.2.3. Consistently Attaching Great Importance to the Regulatory Management of Benchmark Interest Rates

Unlike the global community attempting to remedy only after the LIBOR scandal came to light, the PBC has been highly prioritizing the development and regulation of China's benchmark interest rates. Since its establishment, the Self-regulatory Mechanism for Market Rate Pricing has been under the direct guidance of the PBC to actively participate in the development of China's benchmark interest rate system. The full engagement and supervision of regulatory authorities and the self-regulatory organization have effectively enhanced the quality and credibility of benchmark interest rates. As for the quote-based interest rates, such as SHIBOR, the PBC has guided the establishment of implementation policies and evaluation mechanism to evaluate quality of quotes by quoting banks; the PBC also undertakes regular reviews on the quality of quotes by quoting banks, highlighting their obligations in completing actual transactions with the quoted price, and adopting the last-place elimination scheme to make sure that quoting banks will responsibly carry out their quoting duties. As for the transaction-based interest rates, such as DR and R, the PBC has guided CFETS to perform market monitoring functions and regulate trading and contractual behaviors so as to safeguard market order and ensure the fairness of transaction interest rates.

2.3. Further Cultivating China's Interbank Benchmark Interest Rate System with DR as Representative

Generally, China's benchmark interest rate system has been relatively sound. While LPR is widely used in loan pricing, other benchmark interest rates mainly played a role as indicators to measure supply and demand of funds in the market, and are rarely used directly as pricing benchmarks for financial instruments. Next step, the priority of the development of China's benchmark interest rate system is to promote wider use of these benchmark interest rates. As DR best reflects the level of liquidity and funding rates in banking sector, enjoys relatively high market recognition, and mostly

resembles RFRs, i.e., new international benchmark interest rates, more efforts will be made in innovating and broadening the use of DR in financial products, making it a key reference indicator for monetary policy management and financial market pricing.

2.3.1. Encouraging the Issuance of Floating-Rate Bonds Referencing DR and Related Interest Rates

The coupon rate of floating-rate bonds is adjusted regularly with the reference interest rate, which has the effect on avoiding the risk of interest rate fluctuations for both issuers and investors. However, the current floating-rate bond depository in China's bond market is only 1.1 trillion Yuan, accounting for 1.06% of the total bond market, thus it has huge room for development. In the future, efforts could be made in moderately simplifying the approval process, providing 'green channels' to prioritize floating-rate bond issuance, and reducing issuance and custody fees, etc., to encourage policy banks, commercial banks, and securities companies to issue floating-rate bonds referencing DR and related interest rates.

2.3.2. Promoting FDR-Based Interest Rate Swap Transactions

At present, trading in derivatives referencing FR as the floating end interest rate has been relatively active. FDR is the fixing of DR, and now China has also launched IRS products with FDR as the reference interest rate on the floating end, but the development is relatively slow. Further promoting the development of this IRS product can not only expand the application scope of DR, enhance its market recognition and influence, but also better discover and verify the rationality and effectiveness of DR through derivative transactions. It will also facilitate the issuance of DR-based floating-rate bonds and meet the risk management needs of the issuers and investors. In the future, we will actively promote current market participants to carry out more IRS transactions referencing FDR, and at the same time actively promote the improvement of derivatives market management, encourage more market entities to participate in the IRS market, and facilitate the interest rate risk management and hedging for market participants, as well as help providing favorable conditions for the building of benchmark interest rate system.

2.3.3. Encouraging Financial Institutions to Conduct Interbank Business with Reference to DR

At present, interbank business is mainly fixed interest rates-oriented, with few floating interest rate instruments used, and there's only a very small part of interbank CDs that is with floating interest rates, and its share in the entire interbank CDs market is less than 1%. In the future, we will timely expand the available selection of benchmark interest rates in floating-rate interbank CDs pricing, from SHIBOR to DR and other related interest rates. At the same time, if necessary, appropriate incentives can be given to financial institutions to issue and trade floating-rate interbank CDs with reference to DR and related interest rates in terms of issuance plan filing, transaction fee reduction and related evaluations and assessments. In addition, it's actively encouraged for the financial institutions to carry out interbank lending, interbank deposits, and other businesses referencing DR.

2.3.4. Encouraging International Organizations to Use DR as the RMB Benchmark Interest Rate

Recently, the BRICS (Brazil, Russia, India, China and South Africa) have set up Contingent Reserve Arrangement (CRA), in order to help its member states to deal with the financial crisis. And it is considering including RMB as new reserve currency, as well as selecting the corresponding reference rates for each currency. As RMB has gradually become the major international settlement and reserve currency, DR will be actively recommended when international organizations are to select RMB benchmark interest rate.

2.3.5. Research on Constructing Term Rates Based on Short-Term DR

As interbank trading is concentrated in the short end, short-term DR has a stronger referencing character, but financial market also has certain demand on using medium and long-term interest rates. Due to this reason, we could refer to the international practices, and needs of China's financial market development, to research on constructing term interest rates based on short-term DR, and create conditions for broadening application scope of DR. Specific ways include researching on constructing term rates based on the short-term DR using the backward-looking approach, as well as promoting the FDR001-based OIS market development, exploring and building forward-looking term rates. The central bank MLF rate, the medium-term policy rate, provides guidance to medium- and long-term market rate.

Conclusion

Fostering and perfecting the benchmark interest rate system, as well as participating in and adapting to the international benchmark interest rate reform, are important parts of China's market-oriented interest rate reform and financial market construction. The work is also a key point in improving the transmission mechanism of interest rate from central bank's policy rate to market benchmark rate, and then to market rate. PBC will continue to carefully summarize experience, and improve both the benchmark interest rates and the market-based interest rate system, to make sure market mechanism to play a decisive role in the formation of interest rate and the resources allocation. At the same time, in light of the actual needs of domestic financial market, PBC will guide the Self-Regulatory Mechanism for Market Rate Pricing in organizing major banks to actively participate in international benchmark interest rate reform, and facilitate a smooth transition of international benchmarks in domestic market.