

REFERENCE INTEREST RATES: ROLE, CHALLENGES AND OUTLOOK

ARTICLES

Reference interest rates:
role, challenges and outlook

Reference interest rates are frequently used interest rates that link payments in financial contracts to standard money market interest rates. They serve as benchmarks for determining payments on wholesale and retail loans, on floating rate notes and on derivatives contracts aimed at managing interest rate risk. They are also entrenched in the global financial system via their usage in the valuation of financial instruments and as a basis for performance measurement. This article reviews the role traditionally played by reference rates, with a particular focus on the role that EURIBOR plays in the monetary policy transmission mechanism in the euro area. Based on the recent evidence of manipulation of reference interest rates and declining activity in the underlying market, the article summarises the ECB's views on the current debate on the possible options to reform these reference rates, as well as the initiatives taken by the ECB to establish commonly agreed principles that will strengthen the existing governance framework and to develop a next generation of reference rates that are better anchored to observable transactions and more representative of the underlying market conditions. It also presents some preliminary results of the transaction data collection exercise that was carried out by EURIBOR-EBF and supported by the ECB in order to assess the scope for a transaction-based reference rate that could act as a credible substitute for EURIBOR. The article concludes that, while the reforms already implemented or to be introduced represent significant progress in terms of strengthening the governance framework, restoring credibility and reducing the risks of manipulation, further steps need to be taken to explore alternative reference rates that are more transaction-based and that could be a potential substitute for the current reference rates. The article also concludes that reference interest rates reflecting banks' unsecured funding costs will continue to play an important role, although they will probably need to be complemented by alternative reference rates so that users can choose reference rates that better match their needs.

I INTRODUCTION

Reference interest rates (in particular TIBOR¹, LIBOR² and EURIBOR³ are interest rates that link payments in a financial contract to standard money market interest rates. Given the growing importance of these reference interest rates within the financial community over time, the transmission of monetary policy is significantly influenced by the link between key reference interest rates and the central banks' key policy interest rate. Since the 1990s reference interest rates based on unsecured interbank lending and borrowing have become dominant, as they facilitate the management of banks' funding risks owing to the role that banks play in credit channeling. This has made reference rates an essential tool in the transmission of monetary policy decisions along the yield curve, thereby affecting the investment decisions of many economic agents.

The allegations that have emerged since 2012 relating to the manipulation of key reference rates such as TIBOR, LIBOR and EURIBOR have triggered a widespread debate on the appropriateness of the process used to set reference interest rates. Yet this debate is supplemented by a more fundamental question on the continuous representativeness of the interest rates used at present, given the ongoing decline in the underlying market volumes and higher concentration. The ECB believes that there is significant scope to reform these reference rates further. Taking into account

1 TIBOR stands for "Tokyo interbank offered rate". Since 1995 it has been administered by the Japanese Bankers' Association. For further information, see http://www.zenginkyo.or.jp/en/tibor/the_jba_tibor/index.html

2 LIBOR stands for "London interbank offered rate". It has thus far been administered by the British Bankers' Association, but its administration will be transferred to NYSE Euronext Rates Administration Limited by early 2014. For further information, see <http://www.bbalibor.com/news>

3 EURIBOR stands for "euro interbank offered rate". Since 1999 it has been administered by EURIBOR-EBF. For further information, see www.euribor-ebf.eu

the importance of these reference rates in the implementation and transmission of monetary policy, any reform should distinguish between short-term, governance-enhancing measures aimed at immediately increasing market confidence in these rates and more medium to long-term measures aimed at making reference rates more transaction-based and more representative.

The aim of this article is thus threefold. First, to recall the purpose and role of reference interest rates such as EURIBOR in the euro area and their importance from a monetary policy perspective (see Section 2). Second, to explain the background behind the current debate on the appropriateness and representativeness of the reference interest rates (see Section 3). Third, to present the various initiatives taken by the official sector, including the Eurosystem, to enhance the integrity of current reference interest rates and to encourage the adoption of more transaction-based ones (see Section 4). In conclusion, the article draws some conclusions on what has been achieved thus far and the tasks that lie ahead (see Section 5).

2 TRADITIONAL ROLE OF REFERENCE RATES

To understand the importance and social value of reference interest rates such as TIBOR, LIBOR and EURIBOR, it is first essential to recapitulate the evolution of banks' funding over time, which in the 1990s gradually moved from a bank-based financial system towards a market-based financial system. Reference interest rates, such as LIBOR or EURIBOR's predecessors in the euro's legacy currencies, were initially created in the late 1980s in the context of syndicated loans as a more transparent and cost-efficient way for banks to pass on their funding costs to their customers by adding a spread to a reference rate representative of their marginal funding costs. The standardisation of the pass-through rate in financial contracts also led to the emergence of derivatives, initially in the form of forward rate agreements (FRAs) and then swaps. These derivatives allowed banks to offer fixed rate loans while hedging their variable funding costs.

2.1 ROLE, NATURE AND CALCULATION OF REFERENCE RATES

Reference interest rates are snapshot assessments of certain market rates. Traditionally their role has been to determine the pay-offs of standardised financial contracts by applying a formula to the value of one or more underlying asset or price.

Based on the ESMA-EBA Principles for Benchmark-Setting Processes in the EU,⁴ several different roles in the rate-setting process can be identified. First, there is the so-called reference rate administrator, which is the legal entity that sponsors the creation and operation of the reference rate. It is also responsible for the calculation of the reference interest rate, as well as the methodologies and governance of the rate-setting process. Second, there are the contributors, i.e. the legal entities which contribute to the reference data used in the reference rate calculation process. Third, there is the calculation agent, which is the legal entity that calculates the reference rate based on the data submitted by the contributors. This entity may coincide with the administrator or be a third party to which the administrator has assigned this role. Finally, there is the publisher, which is the legal entity that makes the reference rate values available via publicly accessible media.

Based on the data used to calculate the reference interest rates, a distinction can be made between transaction-based reference rates, which are based on the rates applied to actual transactions, and

4 For further information, see www.esma.europa.eu/system/files/2013-659_esma-eba_principles_for_benchmark-setting_processes_in_the_eu.pdf

quote-based reference interest rates, which are based on estimates of the rates at which transactions can be executed. Depending on the data submitted, unsecured market reference rates can be further differentiated between reference rates for lending and borrowing.

For example, in the specific case of the euro area and EURIBOR, EURIBOR-EBF⁵ is the benchmark administrator, while Thomson Reuters is the calculation agent and publisher that uses data submitted by a panel of contributing banks. EURIBOR is a quote-based reference rate and is calculated as a trimmed mean after the elimination of the top and bottom 15% of the contributions. Contributions are based on the following definition: “EURIBOR® is the rate at which Euro interbank term deposits are offered by one prime bank to another prime bank within the EMU zone, and is published at 11:00 a.m. (CET) for spot value (T+2).”⁶ It does not necessarily refer to the interbank lending rates of the contributing bank, but rather to those at which euro interbank term deposits are offered by one prime bank to another prime bank within the euro area.⁷

TIBOR, administered by the Japanese Bankers Association, is based on quotes the panel of contributing banks provide on the basis of what “they deem to be prevailing market rates, assuming transactions between prime banks”. There are two types of TIBOR rate, namely the Japanese Yen TIBOR and the Euroyen TIBOR, depending on whether the quotes provided refer to the Japanese unsecured call market or the Japanese offshore market.

In contrast with EURIBOR and TIBOR, LIBOR, which has so far been administered by the British Bankers’ Association (BBA)⁸ and is calculated and published by Thomson Reuters, is based on the answers provided by a panel of banks to the question: “At what rate could you borrow funds, were you to do so by asking for and then accepting inter-bank offers in a reasonable market size just prior to 11 a.m.?” Therefore, submissions are based on the lowest perceived rate at which a bank on a certain currency panel could access the interbank money market and obtain sizeable funding for a given maturity. LIBOR refers to the estimated borrowing costs charged to contributing banks and may therefore have a stronger signalling effect on the creditworthiness of these banks. Such signalling effects may have increased the incentives to manipulate individual submissions during the financial crisis.

The euro overnight index average (EONIA) is a transaction-based interest rate used for the euro area overnight segment of the money market. It is calculated by the ECB, with EURIBOR-EBF as the benchmark administrator and Thomson Reuters as the publisher, as a weighted average of the interest rates on unsecured overnight lending transactions denominated in euro reported by a panel of contributing banks. The ECB’s role as the calculating agent of EONIA stems from the high level of confidentiality required for the handling of the submissions of individual bank transaction data, as well as the need to ensure that the data are treated with the utmost confidentiality by an impartial third party. The transaction-based nature of the submission minimises the extent of the subjectivity implicit in quote-based systems, reduces the risk of manipulation – although it does not eliminate it – and facilitates the ex post validation process.

5 EURIBOR-EBF is an international non-profit-making association that was founded in 1999 with the launch of the euro. Its members are the national banking associations of those EU Member States that have adopted the euro.

6 See <http://www.euribor-ebf.eu/euribor-org/about-euribor.html>

7 The concept of a prime bank has recently been clarified in the Code of Conduct as “a credit institution of high creditworthiness for short-term liabilities, which lends at competitive market related interest rates and is recognised as active in euro-denominated money market instruments while having access to the Eurosystem’s (open) market operations.” The concept of an interbank deposits has also been clarified in the Code of Conduct as “a cash deposit between two credit institutions, maturing by one year from inception.”

8 On 9 July 2013 the board of the BBA voted unanimously to approve the transfer of the administration of LIBOR to NYSE Euronext Rates Administration Limited. The BBA will hand over the administration of LIBOR to that entity following approval by the United Kingdom’s Financial Control Authority. The transition to the new administrator is expected to be completed in early 2014.

2.2 RELEVANCE OF REFERENCE RATES FOR EURO AREA MARKETS

Through hedging activities (via swap and FRA contracts), there is a close link between cash (spot and term) deposit interest rates and the derivatives segments of the money market. Transactions in the cash and derivatives segments of the money market (in the euro area and other jurisdictions) are conducted mainly over the counter (OTC), which makes it difficult to trace the rates and volumes of the transactions made. This, in turn, increases the importance of having a reliable benchmark reference on a term that is representative of the funding conditions for financial contracts (retail loans, wholesale banking activities, syndicated loans) as well as OTC financial derivatives (FRAs, short and long-term swaps, swaptions) and exchange-traded financial derivatives (futures contracts and options on those futures contracts).⁹

In the case of the euro area, EONIA is the usual reference interest rate for euro overnight indexed swaps (OISs). EURIBOR serves as a pricing benchmark for variable rate loans and mortgages, and is the reference rate for most interest rate swaps (IRSs) and other OTC-traded derivatives, such as FRAs, and exchange-traded short-term interest rate futures contracts. The creation and trading of these instruments has developed rapidly on account of their potential for leveraging and hedging interest rate risk.¹⁰

According to the latest data available from the BIS, at the end of 2012 the notional amount¹¹ outstanding of single-currency OTC interest rate derivatives (FRAs, swaps and options) was USD 489.7 trillion.¹² Of this total, the largest shares by currency were the notional amounts referenced to euro interest rates (equivalent to USD 187.4 trillion, of which USD 137.6 trillion were IRSs, USD 25.6 trillion FRAs and USD 24.2 trillion interest rate options), which were greater than the amounts referenced to US dollar rates (USD 148.7 trillion). There is broad consensus in the market that the main reference rate underlying euro interest rates is EURIBOR, although there is no mention of this in the BIS data. With regard to exchange-traded interest rate derivatives, data published by Euronext show that the total notional amount of the three-month EURIBOR futures contracts traded on the LIFFE exchange in London in 2012 amounted to €178.7 trillion and that of EURIBOR options on futures was €70.7 trillion. These contracts are primarily, although not exclusively, used by banks to hedge a significant part of their balance sheet against interest rate risk while performing their maturity transformation function.

However, the traditional role of reference interest rates based on the unsecured interbank market is currently being challenged by the developments that have occurred since the onset of the financial crisis. First, the relationship between market reference rates and the individual cost of funding has been significantly weakened, as the latter reflects more frequently country-specific or bank-specific factors. Second, in terms of banks' funding, there has been a gradual, albeit significant, shift from the unsecured to the secured segment. In this regard, declining volumes and the higher concentration have called into question the representativeness of reference interest rates.¹³ These developments may undermine the benefits of using reference rates or lead banks to charge higher spreads on

9 For a full description of the LIBOR-type fixings, see Gyntelberg, J. and Wooldrige, P.D., "Interbank rate fixings during the recent turmoil", *Quarterly Review*, BIS, March 2008.

10 Options now exist on both IRSs and futures contracts, which are the starting point of the price formation mechanism of market-implied volatilities for euro interest rates.

11 The notional value is the nominal amount of the asset, reference rate or index underlying a derivative financial instrument. It is different from the market value that results from the netting of the respective obligations of the buyer and of the seller of the contract, which represents the replacement cost of a given contract transacted at a given price at any point in time.

12 BIS data covering the G10 countries since the end of June 1998, as well as Australia and Spain from December 2011.

13 See also the discussion in Brousseau, V., Chailloux, A. and Durré, A., "Fixing the Fixings: What Road to a More Representative Money Market Benchmark?", *IMF Working Paper*, No. 13/131, May 2013.

market reference rates to compensate for adverse changes in their own refinancing costs and hedge their basis risk.

The volatility of banks' credit risk premia has also highlighted the credit risk component embedded in these rates, making them less appropriate as a proxy for risk-free rates, as they used to be perceived. In turn, the growing awareness of the credit risk component embedded in traditional unsecured market reference interest rates has pushed up demand for reference interest rates, such as OISs, to be as risk-free as possible and not to reflect the term, liquidity and credit risk premia embedded in traditional unsecured market reference interest rates. In particular, such OIS rates have increasingly been seen as more appropriate for evaluating centrally cleared standardised OTC derivatives and OTC derivative positions based on comprehensive collateralisation arrangements.

2.3 IMPORTANCE OF REFERENCE INTEREST RATES FROM THE MONETARY POLICY PERSPECTIVE

From the ECB's perspective, EURIBOR and EONIA are of crucial importance for the efficient functioning of both the euro area and the international financial system. Their role has evolved over time, together with their standardisation and the increased liquidity and availability of financial instruments referring to them. Monetary policy decisions and market expectations of the future path of policy rates are directly reflected in the interest rates that serve as a reference for highly liquid and standardised derivative products, such as FRAs, futures and IRSs. In turn, these form the basis for the pricing of various, usually less liquid, marketable debt instruments, thus influencing financing and credit conditions.

Given the crucial role of EONIA and EURIBOR in the formation of both euro money market interest rates and market expectations regarding the future values of short-term interest rates, they also play an essential role in the interest rate channel, which transmits the monetary policy stance along the yield curve. Over time, they have therefore gained a social function and are now a public good. Both interest rates help to ensure a homogeneous pricing benchmark for the entire money market yield curve across the euro area.

Today, the existing reference interest rates for the unsecured market are still used as a standard in the financial industry, despite the decreasing turnover in the underlying market. As reported in the table, almost 60% of total loans to non-financial corporations in the euro area were floating rate loans at the end of March 2012; their interest rates were hence referenced mostly to EURIBOR. At the same time, the proportion of floating rate loans in total loans to households was lower, at 40%, although it had been rising over time. It is also interesting to note that these average figures for the euro area conceal significant differences between countries.

Share of floating rate loans in total loans for the euro area

(data as of March 2012; percentages)

	EA	AT	BE	DE	EE	ES	FI	FR	GR
Non-financial corporations	56	72	54	37	78	65	82	38	69
Households	40	63	19	11	89	89	93	16	52
	IE	IT	LU	MT	NL	PT	SI	SK	CY
Non-financial corporations	61	77	69	82	60	76	82	75	52
Households	59	72	74	94	21	94	76	26	32

Source: MFI balance sheet item statistics.

Notes: Floating rate loans include short-term (less than one year) and long-term floating rate loans. All floating rate loans are pooled together with no distinction of reference rates, such that the breakdown of these loans by reference rate is not known.

Therefore, the social value of the pricing of reference interest rates appears even higher, since it affects not only the relationships between financial investors at the very short end of the yield curve, but also the relationships between banks and economic agents.

3 RECENT DEBATE ON REFERENCE INTEREST RATES

The evidence and allegations of manipulation of reference rates, as well as the structural market changes that have occurred or have been gathering pace since the start of the financial crisis, have highlighted the need to change current rules and practices with regard to the determination of reference rates and move towards a more regulated approach, given that they are widely recognised as a public good.

Given the role of reference interest rates in the monetary policy transmission mechanism, as described in Section 2.3, it is also appropriate for the public sector to define which role it should play in (i) the development of commonly agreed principles to strengthen governance frameworks that enhance the reliability and integrity of reference interest rates; and (ii) the development of reference interest rates that are more representative of market conditions and which better match market participants' individual needs.

3.1 GOVERNANCE ISSUES SURROUNDING THE RATE-SETTING PROCESS

A comprehensive review of all governance issues surrounding the rate-setting process has been undertaken in various jurisdictions and in several fora. The UK Treasury's Wheatley Review of LIBOR, the ESMA-EBA's Principles for Benchmark-Setting Processes in the EU, the IOSCO's Principles for Financial Benchmarks, the European Commission's forthcoming proposals for the regulation of benchmarks, as well as its current proposals for a regulation on market abuse and for a directive on criminal sanctions for market abuse,¹⁴ are all examples of initiatives to address, inter alia, the need to ensure that reference interest rates are adequately governed, administered and regulated in order to appropriately guard against market abuse or systematic errors.

The principles embedded in these initiatives define a sound framework for the submission process at the level of contributors, and, with regard to governance, minimise conflicts of interest within rate administrator bodies, by retaining the expertise but reducing the influence of the banking community through the involvement of other stakeholders. These principles also recommend minimum standards for calculation agents, publishers and users, as well as a stricter sanctioning regime. The timely, consistent and effective implementation of these principles should significantly limit the opportunity for abuse and improve rate-setting practices. In this respect, EURIBOR-EBF took steps to review the EURIBOR governance process and implement the recommendations set out in the joint ESMA-EBA review. These include (i) enlarging the composition of the EURIBOR Steering Committee to include non-bank stakeholders; (ii) consulting stakeholders on the number of EURIBOR tenors, with a view to preserving only those with the highest utilisation and the highest underlying transaction volume; and (iii) reviewing the key terms in the EURIBOR definition to enhance clarity. While further work needs to be undertaken in order to implement the ESMA-EBA's recommendations, these governance-enhancing actions are a major step in the right direction.

¹⁴ See "Amended proposal for a Regulation of the European Parliament and of the Council on insider dealing and market manipulation (market abuse) (submitted in accordance with Article 293(2) TFEU) (COM(2012) 421 final)"; and "Amended proposal for a Directive of the European Parliament and of the Council on criminal sanctions for insider dealing and market manipulation (submitted in accordance with Article 293(2) TFEU) (COM(2012) 420 final)".

3.2 REPRESENTATIVENESS OF REFERENCE INTEREST RATES

However, in addition to the reform of the governance framework for the rate-setting process, there is the broader question as to whether the dominance of reference interest rates based on unsecured interbank markets reflecting a common bank credit risk is still appropriate today.

In this regard, it is interesting to note that the shift from unsecured to secured interbank borrowing and lending started even before the onset of the financial crisis and accelerated thereafter (see the chart).

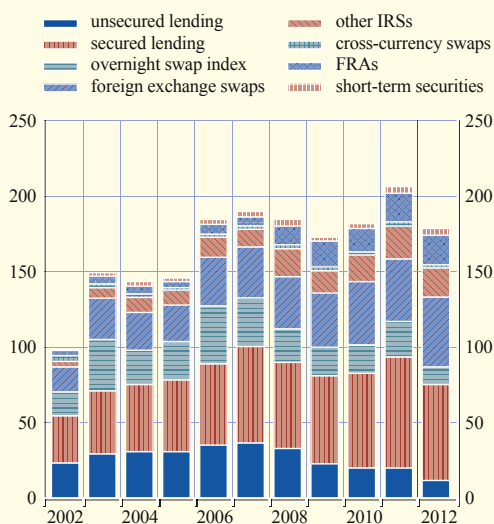
Unsecured interbank markets have shrunk considerably, particularly for longer maturities. Therefore, the remaining market turnover is currently concentrated only within the shortest maturities, as confirmed by the results of the data collection exercise undertaken by the ECB (see the box). Changes to the liquidity regulations, such as the introduction of the Liquidity Coverage Ratio (LCR) and the Capital Requirements Directive (CRD IV), which are aimed at reducing and better managing liquidity and counterparty credit risks, provide further incentives to shift from unsecured to secured interbank markets and to limit unsecured interbank activity to shorter maturities. Moreover, the dispersion of bank credit risk has increased sharply, implying that the true refinancing costs of banks deviate from – and are likely to be much more volatile than – the lending rates between prime banks referenced to EURIBOR, which used to be seen as a proxy for a risk-free rate.

The contraction in volumes of unsecured interbank markets, as well as the other structural changes described in Section 2.2, call into question the continuous representativeness of the current reference interest rates for the segmented and heterogeneous borrowing conditions in the unsecured interbank market. The challenge is to identify the necessary design changes to such unsecured market reference rates in order to preserve and enhance their representativeness. In fact, in spite of these developments, reference interest rates reflecting banks' unsecured funding costs and incorporating a generic bank credit risk premium are very likely to remain necessary for some users as a benchmark of the "true" costs at which banks can obtain wholesale market liquidity and not – as in the secured market – exchange cash for another asset. Another challenge is how to facilitate greater diversity in the use of reference interest rates that better match users' needs. This would require a greater availability of reference rates that do not incorporate a bank credit risk premium, but which instead are more similar to risk-free rates or reflect a sovereign risk premium.¹⁵

15 An example of a reference rate that reflects a sovereign risk premium is the TEC 10 index ("*Taux de l'échéance constant à 10 ans*") in France. The index value represents the yield to maturity of a fictitious OAT ("*obligation assimilable du Trésor*", namely French public bond) with a constant maturity of precisely ten years. It is based on primary dealers' quotes at 10 a.m. on the secondary market for two OAT benchmark issues that are closest to ten-year maturity. The four highest prices and the four lowest prices are eliminated, and the average of the remaining prices is converted into an equivalent yield to maturity for each OAT. The TEC 10 daily reference value is then calculated by linear interpolation of the equivalent average yield of the two OATs.

Aggregated average daily turnover of the euro money market

(index: aggregated average daily turnover volume in 2002 = 100)



Source: Euro money market study, ECB, December 2012.

3.3 ROLE OF PUBLIC AUTHORITIES AND CENTRAL BANKS

Given the importance of reference interest rates in the economy and their role as a public good, the Economic Consultative Committee of the BIS established a working group¹⁶ to study issues relating to the use and production of reference interest rates from the perspective of central banks, and encouraged public authorities and central banks to support the reliability, integrity, robustness and representativeness of reference rates. In particular, it recommended that central banks become involved in the reform of reference interest rates by (i) ensuring an appropriate governance framework to uphold the reliability and integrity of reference rates; and (ii) facilitating market choices in a changing financial system.

4 CONTRIBUTION OF THE ECB TO THE DEBATE

The ECB believes that the systemic relevance of reference rates justifies actively involving central banks in the reform process. To uphold the reliability, integrity and representativeness of key euro area reference interest rates, the ECB has actively participated in the consultations on reference interest rates launched by the European Commission, the ESMA-EBA and the IOSCO.¹⁷ These initiatives complement each other: the ESMA-EBA and Commission's initiatives are broader in scope, although limited to the EU, while the IOSCO's principles are narrower and focused on financial market benchmarks, and apply at the international level. Notwithstanding this role of central banks, the ECB believes that choosing reference rates that better reflect end-user needs is ultimately the responsibility of the users themselves.

The ECB's initiatives can be summarised as follows: (i) participation in public consultations of regulators; (ii) public reminders to banks to act responsibly and assume collective responsibility to safeguard the functioning of key reference rates, thus preventing potential disruption to the functioning of financial markets while the regulatory framework is being refined; and (iii) acting as a catalyst for private market initiatives to assess the options for reforming the current reference rates, in particular EURIBOR.

The views of the ECB on the governance issues and options for reforming current reference interest rates in order to preserve and enhance their representativeness are described in the next two subsections.

4.1 OPTIONS FOR REGULATION AND GOVERNANCE REFORM

In its reply to the European Commission's public consultation, the ECB recommended adequately defining the principles and procedures for the four key processes surrounding the computation of EURIBOR: (i) rate submission at the level of the panel bank to ensure that rates are accurate and conflicts of interest are prevented; (ii) rate calculation with a better definition of the responsibilities of the calculation agent and the legal responsibilities of all parties involved in case of suspect/unusual quotes; (iii) benchmark administration to ensure the independence of the administrator from the banking community and a greater diversity of its members with more clearly defined

¹⁶ See <http://www.bis.org/publ/othp19.htm>

¹⁷ See *European Commission's public consultation on the regulation of indices – Eurosystem's response*, ECB, Frankfurt am Main, 14 November 2012; *Eurosystem's response to IOSCO's consultation report on financial benchmarks*, ECB, Frankfurt am Main, 11 February 2013; and *Eurosystem's response to the EBA and ESMA's public consultation on the principles for benchmark-setting processes in the EU*, ECB, Frankfurt am Main, 11 February 2013.

responsibilities; and (iv) ex post validation by independent entities to validate the quality of the contributions and of the rate submission process.

On 8 February 2013 the ECB also welcomed the European Commission's intention to regulate systemically important reference interest rates and to include in its forthcoming legislative proposal the power to compel mandatory submissions for systemically important reference interest rates, in order to ensure an appropriate level of bank participation.¹⁸ In particular, the ECB believes that it is crucial that banks remain in, or join, the EURIBOR and EONIA panels to prevent potential disruptions to the functioning of the financial markets, as well as to ensure an appropriate level of rate representativeness while the regulatory framework is being refined. In the same vein, the ECB welcomed on 31 May 2013 EURIBOR-EBF's decision to introduce separate EONIA and EURIBOR panels with a view to encouraging banks to join or rejoin the respective panels according to their level of activity and knowledge of market segments.¹⁹

While supporting these initiatives and expressing the hope that they are adopted and enter into force quickly, the ECB, in its responses to the IOSCO's and the ESMA-EBA's consultations, also laid down certain criteria that the regulatory process and the governance reforms should meet.

Regulatory requirements and supervisory practices should be commensurate with the identified risks to avoid placing unnecessary or excessive burdens on rate contributors. An appropriate balance should be found between a sound production process with adequate controls and safeguards on the one hand and cost efficiency on the other.

Practices across national jurisdictions should be harmonised. The ECB considers that LIBOR, EURIBOR and other systemically important reference interest rates should be regulated, given their role as a public good. However, in order to be both efficient and effective, regulation and supervision needs to be based on principles introduced in a consistent manner at the international level. Non-harmonised regulation, different interpretations of the same laws and principles and unaligned actions by national supervisors could lead to an uneven playing field, decreasing incentives for voluntary participation and potentially encouraging regulatory arbitrage.

Methodological changes should be appropriate and timely. The ECB welcomes the resolve to strengthen the methodology for the production of reference rates through a more precise definition of their constituent elements and through more representative and transparent data compilation procedures. However, the choice of appropriate and detailed changes to the methodologies should be left to private reference rate administrators and the timeline of any changes should be based on a realistic time frame, also considering the current state of financial markets and the lack of obvious alternatives to the current reference rates.

4.2 OPTIONS TO ENHANCE THE REPRESENTATIVENESS OF REFERENCE INTEREST RATES

The ECB believes that a shift towards a more transaction-based approach to calculating the current reference interest rates would increase their representativeness, while also enhancing their credibility and integrity. The merits of and the best method for shifting towards a more transaction and market-based reference interest rate for an unsecured money market need careful consideration.

¹⁸ See *ECB welcomes the European Commission's intention to regulate systemically important reference rates*, ECB, Frankfurt am Main, 8 February 2013.

¹⁹ See *ECB welcomes the introduction of separate EONIA and EURIBOR panels and encourages banks' participation*, ECB, Frankfurt am Main, 31 May 2013.

Acting as a catalyst for private market initiatives, the ECB conducted a data collection exercise on behalf of EURIBOR-EBF (see the box) in order to be able to better assess the feasibility of such a shift and its modalities. The exercise confirmed that the significant structural and conjunctural contraction in unsecured, interbank money market volumes is limiting unsecured turnover to shorter maturities. While the turnover for these shorter maturities is limited and raises challenges in terms of establishing a purely transaction-based reference rate, further measures could be taken to increase the underlying turnover. These include a widening of the corridor around standard tenors to capture non-standard transactions and the inclusion of further bank liabilities that play an important role in banks' overall wholesale funding costs. Such measures are currently being investigated with the help of a further data collection exercise also being conducted by the ECB on behalf of EURIBOR-EBF.

Furthermore, while there are significant differences between transaction-based rates and the quote-based EURIBOR, the data collection exercise, although not aimed at assessing the accuracy of EURIBOR, showed that past EURIBOR fixings were broadly in line with the results that could be derived from transaction-based rate calculations.

Box

MAIN FINDINGS OF THE DATA COLLECTION EXERCISE AND THE DESIGN OF A NEW REFERENCE RATE

In February 2013, the ECB, in cooperation with EURIBOR-EBF, initiated a data collection exercise aimed at assessing the feasibility of a transaction-based euro money market reference rate and its modalities. As an impartial player in the money markets, the ECB offered to collect, on behalf of EURIBOR-EBF, daily transaction data from participating banks and to undertake an analysis that would form the basis of further assessment by EURIBOR-EBF and participating banks. During the second quarter of 2013, the ECB collected data from 59 European banks representing current and previous EURIBOR panel members. The scope of the data collection was set deliberately wide to capture banks' unsecured borrowing and lending volumes beyond interbank transactions. On the borrowing side, the data collected included funding through interbank deposits, deposits from other financial but not credit institutions, deposits from the official sector and deposits from the issuance of short-term securities. On the lending side, data on interbank lending and investment via the purchase of short-term securities issued by other banks and non-financial corporations were collected. The reference period was from 3 January 2012 to 28 February 2013, which was considered long enough to be able to draw significant conclusions while remaining cost-efficient. Among the participating banks, 50 are based in the euro area while the remaining nine are based in other EU and EFTA countries. In terms of credit quality, three-quarters of the banks are of medium and high credit quality (of a P-1 and P-2 investment grade respectively, when using Moody's short-term rating equivalents). The purpose of this box is thus to recap the main findings of this data collection exercise conducted by the ECB on behalf of EURIBOR-EBF.

The analysis was conducted taking into account the following five characteristics that the new reference rate would need to have in order to meet the principles laid down by the International Organization of Securities Commissions (IOSCO) and the Bank for International Settlements (BIS). Each of these characteristics was further qualified to assess conformity with the above-mentioned principles:

- (a) Robustness and resiliency: there should be an adequate daily volume and number of contributors. If not, there should be a suitable and credible fall-back mechanism.
- (b) Representativeness: the new rate needs to be representative of the market it intends to measure – the wholesale senior unsecured bank credit market. The level and correlation of the rate in relation to other relevant market rates, as well as the representativeness of the test panel of the targeted market, are useful indicators.
- (c) Usability: in order to be adopted by the market, a reference rate needs to be available on a daily basis, have a simple computation mechanism, a relatively low volatility and predictable behaviour in relation to the underlying credit.
- (d) Reliability: the new reference rate should allow minimum scope for manipulation, both through its governance and computational mechanism.
- (e) Transparency: the determination of the rate needs to be sufficiently transparent in order to be credible and meet governance standards.

Therefore, a sufficient transaction volume is considered a fundamental attribute of a robust reference rate. In this respect, several observations can be drawn from the ECB's data collection as reported in Table A, which displays the average daily volume data at various maturities (or tenors) and for both borrowing and lending transactions with different counterparty sectors. First, the daily volumes for each type of transaction considered individually are small. The volumes in the interbank market confirm the results of the ECB's annual euro money market survey, namely that interbank activity is concentrated within short tenors, with few volumes beyond one week. The other most active tenors are one and three-month tenors, although volumes are low on both the borrowing and lending sides, with average daily turnover below €300 million. Second, interbank borrowing generally has the highest daily turnover among the wholesale funding transaction types considered. Third, funding via the issuance of short-term fixed rate securities plays an important role in unsecured bank term funding: beyond two months, the average daily issuance of short-term securities exceeds the daily turnover in the other borrowing types. Finally, even by aggregating all borrowing or lending transactions, the average daily turnover remains low: if all borrowing transaction types are aggregated, volumes over the period

Table A Average daily volumes, January 2012 to February 2013

(EUR millions)

	one-week	one-month	two-month	three-month	six-month	nine-month	one-year
Deposits from credit institutions	1,317	299	41	184	58	16	55
Deposits from other financials	1,153	217	50	117	33	25	25
Deposits from official sector	802	259	69	246	26	13	11
Short-term securities	314	217	148	545	119	41	81
All borrowing	3,527	939	230	1,083	210	37	142
Lending to banks (Deposits)	929	202	111	167	33	28	31
Lending to banks (Short-term paper)	30	108	46	69	24	84	106
Lending to non-financials (Short-term paper)	60	138	29	67	28	8	11
All lending	972	396	120	248	50	27	46

Note: Daily averages are calculated for the days with turnover activity and non-zero contributions.

are around €3 billion for one-week transactions, €1 billion for one and three-month transactions and less than €250 million for longer tenors; aggregated volumes on the lending side are even lower.

The evidence reported in both Table A and Chart A highlights the difficulty of building a transaction-based reference rate that is a direct substitute for EURIBOR based on unsecured interbank lending volumes alone and for all tenors. Chart A (a) illustrates that, while for one-week maturities there is market activity every day, for the one and three-month tenors there are no transactions on 2% and 13% of business days respectively (see Charts A (c) and (e)). While there are important methodological differences between EURIBOR and the aggregate rate computed on the basis of the lending data collected in this exercise, Chart A also shows that EURIBOR rates broadly followed the evolution of average interbank lending rates (see Charts A (a), (c) and (e)). This exercise also suggests that counterparty credit standing plays an important role in the aggregate interbank lending levels. Indeed, while the levels of average interbank lending rates with a maturity of less than three months are above those of EURIBOR, for longer tenors they are below EURIBOR, as borrowers are likely to be of a higher credit quality.

Charts A (b), (d) and (f) show, in perspective, the volume and rate developments of the three most active borrowing tenors and the relationship with EURIBOR during the period under

Table B Summary of the results of robustness tests for all borrowing transactions

	Dimensions	Tenors	January 2012 to February 2013	July 2012 to February 2013
	Robustness/resiliency (All borrowings)	Volume sufficiency (daily average)	one-week	€ 3.5 billion
one-month and three-month			€ 09-1.1 billion	€ 0.6-0.8 billion
Volume distribution (% of days in which daily volume < a threshold)		one-week	1% of days daily volume < € 1 billion 1% of days daily volume < € 0.25 billion	1% of days daily volume < € 1 billion 1% of days daily volume < € 0.25 billion
		one-month and three-month	~25%-30% of days daily volume < 0.50 billion 10% of days daily volume < € 0.25 billion	~40%-50% of days daily volume < 0.5 billion ~10%-15% of days daily volume < € 0.25 billion
Volume concentration (% of days in which one or two contributors account for 80% or more of the daily volume)		one-week	<1%	1%
		one-month and three-month	~15%-20%	~20%-30%
Contributor sufficiency (daily average)		one-week	27	24
		one-month and three-month	16-17	14
Contributor distribution (% of days in which number of contributors < a threshold)		one-week	Number of contributors equal or above 15 every day	Number of contributors equal or above 15 every day
		one-month and three-month	3%-5% of days <10 contributors ~15%-20% of days <15 contributors	5%-8% of days <10 contributors ~30%-35% of days <15 contributors

review. The test results show that the aggregated borrowing rates are lower than EURIBOR for all tenors. While there are differences between aggregated borrowing levels and EURIBOR, Charts A (b), (d) and (f) show that aggregated borrowing levels mostly track EURIBOR rates. They also show that some divergences occur in a fast-changing rate environment, for example at the beginning of 2012, when, for the one-week tenor, borrowing rates adjusted downwards more quickly than EURIBOR rates.

Chart B shows the computational results of the data collection exercise when aggregating the daily turnover of various transactions on the borrowing side for various maturities. Several observations can also be made. First, the percentage of zero transaction volumes mostly occurred at longer maturities (or tenors), as reported in Chart B (a). Second, Charts B (b) and (c) – illustrating the average rate (computed as a median) spread to EURIBOR – shows that the average rates for the most active tenors were relatively close to each other and the spread to EURIBOR was limited for most of the borrowing transaction types. Chart B (d) shows that, in general, there is potential to aggregate borrowing data across different transaction types without causing significant additional rate volatility. Such volatility could arise as a result of daily changes in the sectoral composition if borrowing levels across different transaction types are significantly different and, as is the case in the current transaction analysis, if some transaction types are more represented than others in the daily rate computation.

Table B summarises the robustness characteristics of aggregated borrowing for the three most active tenors. Several results can be highlighted. First, the daily turnover decreased by about 30% following the ECB's deposit rate cut to zero in July 2012 (the second period of the test), since banks attracted fewer deposits at the lower interest rate levels. For the one-week tenor, these interest rate levels were close to zero or even negative in the case of higher rated banks. Second, the daily volumes are frequently low for tenors beyond one week, dropping below €0.5 billion for a significant number of days. This volume distribution deteriorates significantly in the second period. Third, while in more than four out of five days the number of contributors for the three tenors is higher than 15, in many cases a small number of contributors accounts for most of the volume: for the one and three-month tenors, one or two contributors account for at least 80% of the daily volume approximately 15%-20% of the time. The volume concentration increases significantly in the second period.

The definition of the reference rate and the composition of the bank panel are key determinants of rate characteristics, such as the level of the rate itself and its volatility. The differentiation of credit profiles among panel banks results in different composite borrowing rates when different rate computational methodologies are used. Charts B (c) and (d) show that, for all borrowing, computing the rate as a median of individual contributions – as opposed to using other data aggregation methodologies, such as the volume-weighted average (VWAR), the weighted trimmed mean or the trimmed mean – results in lower rate levels and volatility of rate spread relative to EURIBOR. This is explained by the fact that the median measures the borrowing rate for the typical bank in the sample, which is predominantly higher rated. The test panel heterogeneity has a greater impact for lower volume tenors (Chart B (d)), where daily rates are at times more significantly impacted by contributions which are not necessarily representative of the borrowing rates of most panel banks. Looking ahead, the trade-offs between the representativeness of the rate according to its definition, usability and reliability could be further considered in the reference rate design, together with measures that could increase the volume while also addressing panel heterogeneity.

Chart A Level of interest rates and daily turnover from the data collection exercise, January 2012 to February 2013

(percentages; EUR millions)

- daily turnover (right-hand scale)
- median (left-hand scale)
- weighted average rate (left-hand scale)
- EURIBOR one-week (left-hand scale)

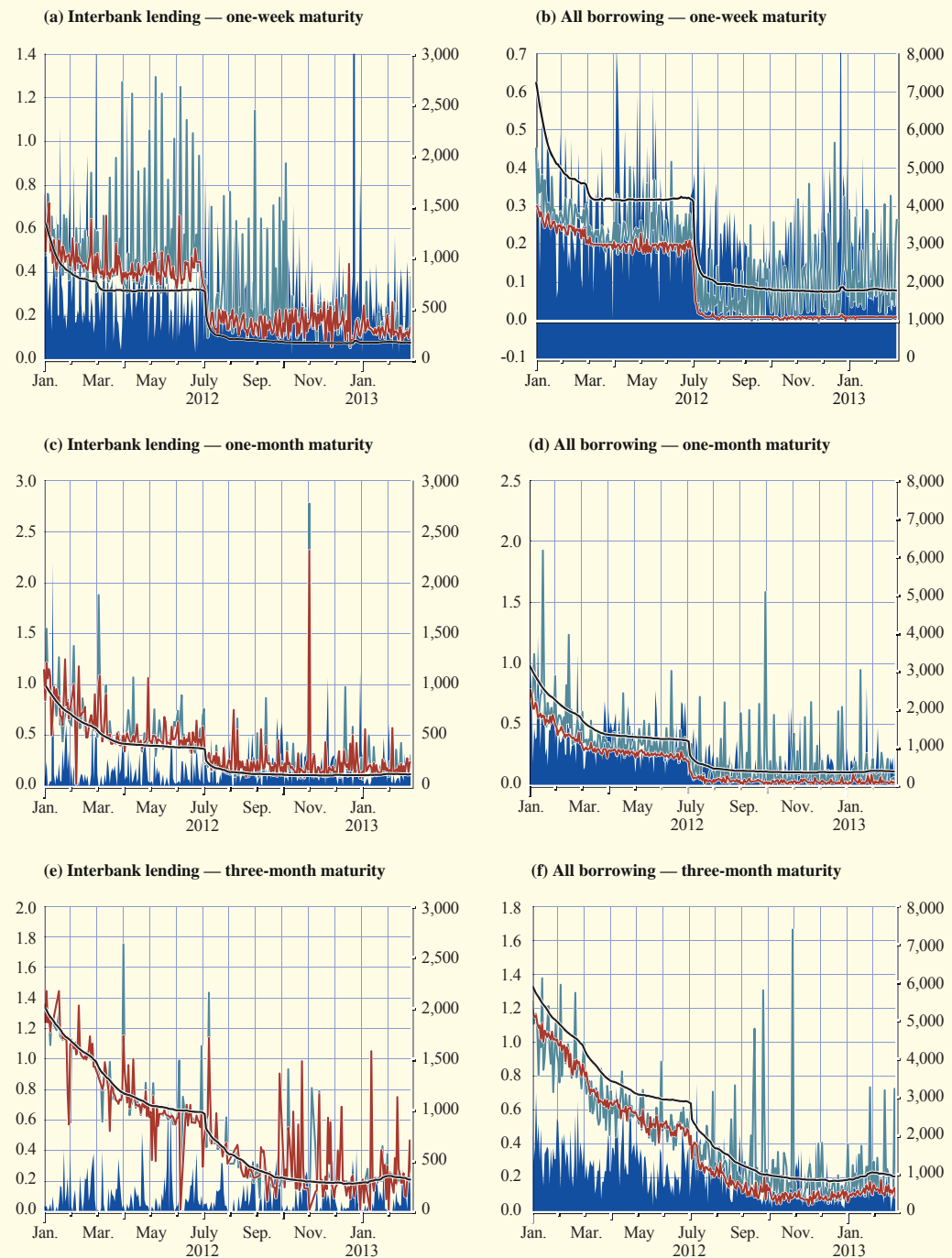


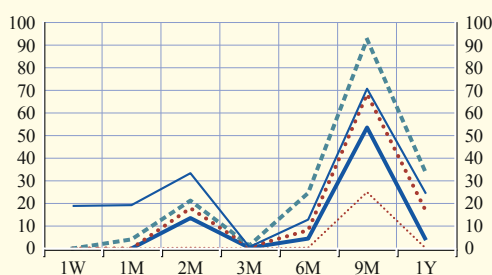
Chart B Main findings of the data collection exercise, January 2012 to February 2013

(percentages)

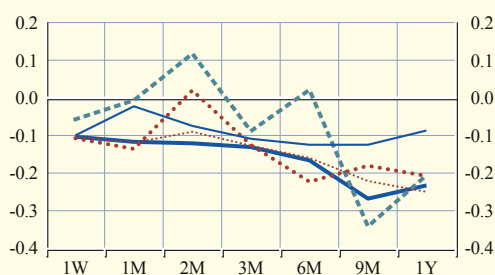
— interbank
 other financials
 - - - official sector
 — short-term paper
 all borrowing

W = week
 M = month(s)
 Y = year

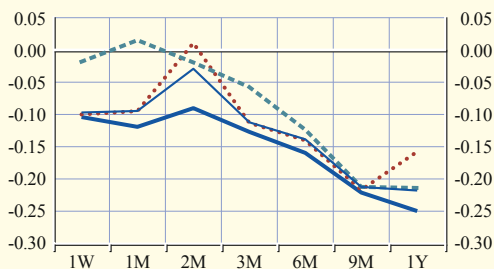
(a) Frequency of zero volume/contributors



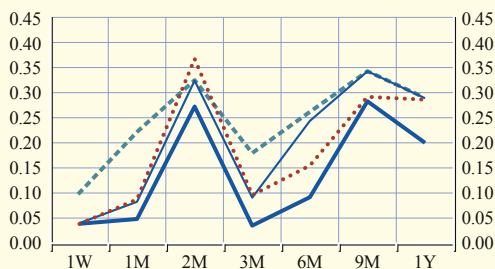
(b) Average daily spread to EURIBOR (computed as median)



(c) Average daily spread to EURIBOR, by computational method



(d) Volatility (standard deviation) of the daily spread to EURIBOR, by computational method



Source: ECB.

The ECB also considers it desirable that market participants can choose from a range of reliable and representative reference rates that reflect different needs and purposes. In the view of the ECB, reference rates representing the OIS derivatives market, sovereign risk or the secured money market segment, for example, could prove to be valid alternatives, coexist with EURIBOR and fulfil some of the purposes for which EURIBOR is currently used by some users. However, it is unlikely that these alternative reference rates would fully eliminate the need for reference rates that reflect banks' unsecured cost of funding for all users. As long as unsecured funding (also in terms of the issuance of short-term securities) still forms a significant part of a bank's funding, there is likely to be a need among some users for reference rates that allow banks to pass on their marginal borrowing costs.

5 CONCLUSIONS

The allegations and evidence of the manipulation of key reference interest rates have called into question the adequacy of their current governance framework and methodology on which they are based. In order to re-establish their credibility – while preserving their benchmark role in the economy – the aim of the policy response that the ECB has strongly supported has been

to immediately restore the credibility of systemically important reference rates by addressing significant deficiencies in their governance framework.

In the ECB's view, such governance reforms are necessary short-term measures that need to be complemented by further initiatives aimed at enhancing the reliability, representativeness and resilience of reference rates in the medium term. The ECB, along with other central banks, is of the view that reference interest rates reflecting banks' unsecured funding costs will continue to play an important role. Reference rates would continue to allow banks to pass on their wholesale unsecured funding costs to customers and better manage their liquidity and asset and liability positions. Therefore, the ECB strongly supports market initiatives aimed at identifying more transaction-based reference rates that could viably complement or substitute for EURIBOR. The solutions are not obvious and thus require careful assessment to take into account the structural changes taking place in the money markets, as well as longer lead times. The collection of transaction data by EURIBOR-EBF supported by the ECB is a valuable opportunity to assess the extent to which a transaction-based rate could be calculated and, if so, what form it could take. The ECB also supports facilitating market choices in a changing financial system so that users can choose reference rates that better match their needs. Notwithstanding the role of public authorities in the reference rate regulation process, and the interest that regulators and central banks have in upholding the credibility, reliability and representativeness of reference rates, the choice of reference rates that better reflect end-user needs is ultimately the responsibility of the users themselves.

The design of the new reference rate needs to take into account the sound principles for reference rates put forward by the IOSCO and the ESMA-EBA. Reference rates need to be designed in a manner that it is representative of the market they intend to measure. The design should also ensure that the scope for manipulation is minimised or that any attempt at manipulation can be reliably detected. Finally, the success of a new reference rate depends on the extent to which it is embraced by users. Therefore, the ECB strongly encourages market participants to be actively involved in the rate design process, in order to ensure that the resulting rate meets market needs.

Under these circumstances, it could be appropriate, from a policy perspective, to consider encouraging the adoption of a more representative reference interest rate, reflecting active and liquid transactions in the interbank market, which remains resilient in times of stress.

Systemically important reference interest rates such as EURIBOR and EONIA are of particular importance in terms of credit provision to the euro area economy and for the implementation of the single monetary policy. Therefore, it is crucial that their continuity is assured at all times, while more long-term reform solutions aimed at making reference rates such as EURIBOR more transaction-based are being assessed. This means, for EURIBOR and EONIA, that banks contributing to these rates remain in their respective panels and, preferably, that more banks join them, including those banks that recently left them. Furthermore, the public and private sectors should work together to review the appropriateness of the current contingency arrangements and enhance them to prepare for circumstances in which the provision of systemically important reference rates is destabilised.

Finally, the greater clarity that the ESMA-EBA's principles and the forthcoming draft regulation of the European Commission have introduced into the rate-setting process should make it easier for banks to continue contributing to the rate-setting process by reducing risks and uncertainty while options for more structural changes in the reference rate definition are further assessed. Transition issues will need to be examined in detail, but this will be better dealt with once a consensus has been reached on the design of more stable reference rates.