



Summary

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After the financial crisis in 2008 and the LIBOR scandal in 2012, the rules regulating reference rates were changed to prevent them from being manipulated. Reference rates are important since they are used in many financial contracts, and it is therefore crucial that they are fair, transparent and accurately reflect the underlying market.

Over the past few years, legislators, authorities and private market participants have taken a number of measures to strengthen the integrity of reference rates and prevent them from being manipulated. One such initiative is the EU Benchmark Regulation, which lays down requirements for those who administer and report reference rates.

Despite stricter regulation, however, there are still problem areas through which reference rates can be manipulated. This could happen, for example, if the underlying market, which the reference rates are supposed to reflect, does not have a sufficient volume of transactions. In such a case, the banks that report the underlying data for the reference rates may use discretionary assessments. These assessments may deviate from the assessments of other banks and could be viewed as an attempt at manipulation.

In order to come to grips with such problems, authorities in several countries and regions have taken initiatives to replace the existing reference rates with new transaction-based interest rates. This replacement process could be costly and risky for participants in the financial markets.

Sweden has not yet begun a transition from STIBOR, the Swedish reference rate, to an alternative reference rate. The framework for STIBOR allows the panel banks to apply some discretionary assessments. The transaction volumes for deposits and lending in SEK between banks are also very low due to long maturities. A transition from STIBOR to an alternative reference rate could take several years to implement even if Sweden is able to draw on the lessons learned in other countries.



Background

Reference rates fulfil an important function on the financial markets. Robust, transparent and generally accepted reference rates enable a high degree of standardisation in financial products since parties can agree on a reference rate to settle payments. Reference rates (which end with “-ibor” for Interbank Offered Rate) in particular play a central role in the financial system. They are used by a number of different participants on the financial markets. Banks use reference rates when granting loans to businesses and households, and the rates play a key role in derivative contracts. They thus reduce the complexity in these contracts and facilitate standardisation.

Reference rates were first published in a number of countries in the 1980s. The need for a reference rates arose with the emergence of the so-called syndicated loan: several banks joined forces (formed a syndicate) when offering loans to a borrower at a variable rate. By forming a syndicate, the lenders were able to distribute the credit risk among them. The interest rate to be paid by the borrower to the banks was expressed as a reference rate plus a spread. Because the banks used a reference rate that reflected the average funding cost from several banks, they were able to transfer the risk of rising funding costs to the borrower. Since the interest rate reflected an average, the reference rate was less affected by individual banks. The spread the borrower must pay in addition to the reference rate was the banks’ margin on the loan to cover any credit losses and yield requirements.

The banks could have used other types of interest rates in their loan contracts; for example, interest rates based on a short-term treasury bond rate plus a spread. Since treasury bonds are traded on a secondary market, there would have been a direct, observable interest rate. However, this interest rate would not have had as strong of a link to the banks’ funding costs, which are based in part on the banks’ creditworthiness. The interest rates between banks and the government therefore differ. This difference also varies over time. The banks would have therefore needed to take on a larger financial risk, for which they would also have needed compensation.

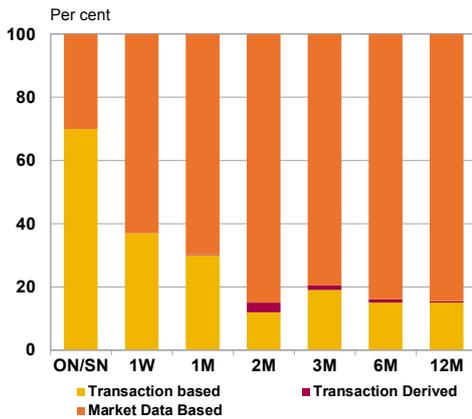
The first reference rate to be published was the London Interbank Offered Rate (LIBOR) in 1986. By asking a number of banks (panel banks) on a daily basis at what rate they could issue unsecured loans with different maturities, the British bankers association was able to calculate an average and publish the results.¹

Stockholm Interbank Offered Rate (STIBOR) was introduced shortly after LIBOR in 1986. The dominant banks on the Swedish money market, which formed the so-called STIBOR panel, were responsible for calculating and publishing STIBOR.

LIBOR, STIBOR and other similar reference rates became an immediate success. They began to be used in loan contracts to determine interest payments. When borrowers then began to use interest rate derivatives to manage their fixed interest rates, the scope of reference rates expanded. Through interest rate derivatives, for example an interest rate swap, borrowers were able to change the profile of their interest payments and thus their interest rate risks without needing to renegotiate the loan contract. Interest rate swaps

¹ The currencies currently published are USD, GBP, JPY, EUR and CHF.

Diagram 1. Percentage of reporting types to USD LIBOR panel in Q4 2017



Source: Intercontinental Exchange 2017 Q4, report on volumes.

Note: "Transaction-based" means that the banks' bids are based on actual transactions. "Derived from transaction data" means that the banks' bids are based on adjusted historical levels using interpolation and parallel shifts. "Market data" means that the banks' bids are based on discretionary assessments, which in turn are based on transactions in related markets, indicative interest rate levels and other market observations.

enabled borrowers to receive an incoming interest payment based on a reference rate that matched the loan's outgoing interest payment. In exchange, the borrower paid a fixed rate in the interest rate swap. This enabled the borrower to transform a loan with a variable rate to a loan, including derivatives, with a fixed rate. The transactions were also carried out among market participants that were not banks. The link to banks' funding costs was therefore less interesting, but LIBOR was still chosen as a reference rate since it was standardised and widely recognised.

Interest rate derivatives grew in popularity, and their use spread outside the original area of application, i.e. to manage fixed interest rates in an existing loan. They began to be used for risk management and speculation. The banks in particular acted as market makers to the sellers and buyers and accumulated large books of interest rate derivatives.

In the market for short-term financing between banks (interbank market), it has become increasingly common since the 1990s with the help of repo transactions to use covered deposits or loans instead of unsecured loans. Unsecured deposits and loans have increasingly been concentrated to very short maturities (overnight). The financial crisis in 2008 and new regulations after the crisis enhanced this trend. As a result, reference rates primarily for the longer maturities are being based to a lesser extent on actual market transactions and to a greater extent on discretionary assessments. The percentage of transaction-based assessments falls as the maturity increases (Diagram 1).

At the same time, the use of interest rate derivatives traded over-the-counter (OTC) – bilateral contracts – has continued to grow. In 2016, the international daily turnover of OTC derivatives amounted to around USD 2,700 billion. In comparison, the figures for 2016 was USD 1,700 billion.² After the financial crisis, the requirements on providing collateral for derivative contracts increased and requirements on central counterparty clearing were also introduced. As a result, firms pledge collateral for their counterparty exposures in interest rate derivatives. The yield on this collateral is normally the overnight rate.

THE LIBOR SCANDAL

In 2012 the LIBOR scandal was uncovered. It became known that several international banks, including Deutsche Bank, Barclays and UBS, had actively manipulated various reference rates. The investigations conducted by the British financial supervisory authority at that time, the Financial Services Authority, determined that LIBOR had been manipulated since at least 2005, but probably earlier as well. The investigations showed that the banks had intentionally influenced their own reporting of interest rates and the reporting of each other's interest rates in order to increase the profitability of their derivative positions. It also became apparent that during the financial crisis the banks also reported lower interest rates than what they actually were able to fund themselves with the intention of hiding their weak financial position. (Edmonds 2014).

Authorities in various jurisdictions have fined a number of banks for manipulating reference rates. For example, the European Commission, pursuant to competition provisions, fined five major banks for

manipulation of the JPY LIBOR and JPY TIBOR reference rates.² In 2013, four banks were also fined pursuant to competition provisions for manipulation of EURIBOR and EONIA.³ In 2016 more banks were fined for manipulation of EURIBOR and EONIA.⁴

DECREASE IN THE NUMBER OF PANEL BANKS

The risk of legal proceeding has made banks less willing to participate in the panels for various reference rates. The number of panel banks for both LIBOR and EURIBOR has therefore decreased since the financial crisis. The current British authority for financial supervision, Financial Conduct Authority (FCA), has worked actively to persuade banks to continue to submit to LIBOR. However, the fundamental problem remains. In a speech in July 2017, Andrew Bailey, Chief Executive of the FCA, announced that the FCA will no longer requires the banks to contribute to LIBOR after 2021.⁵

International Development

INTERNATIONAL INITIATIVES TO ENSURE THE INTEGRITY OF REFERENCE RATES

After the financial crisis and the LIBOR scandal, extensive efforts were undertaken around the world to review reference rates. The International Organization of Securities Commissions (IOSCO) issued a report in 2013, the purpose of which was to prepare an overall framework for benchmarks. The principles were developed to promote reliability and contribute to the improvement of the governance and control, transparency and quality when setting benchmarks. IOSCO also supported the FCA's move to take over supervision of LIBOR and submitted recommendations to national supervisory authorities to investigate the possibility of creating legislation to prevent the manipulation of reference rates within their jurisdictions.

In 2013, the G20 countries decided to give the global body the Financial Stability Board (FSB) the assignment to review reference rates. In its report the following year, the FSB wrote that there is a need to develop reference rates that better reflect the underlying market and are more difficult to manipulate. The FSB proposed that future reference rates should be linked to unsecured interbank markets, that they should be transaction-based and that they should meet the IOSCO's principles for benchmarks. The FSB therefore took the position that improvements should be made to the methodology in the work with the existing reference rates to make them more transaction-based (so-called IBOR+). The Board also saw a need to create transaction-based risk-free interest rates. In other words, the FSB envisioned several types of reference rates in one currency. The hope was that different types of actors would be able to use reference rates that are adapted to their needs. For example, loan contracts would be able to continue to use a reference rate that reflected the banks' funding cost. For derivative contracts, the need has decreased as the areas of application have changed. Given that an increasing

² See Commission Decision 2013 (<https://eur-lex.europa.eu/legal-content>)

³ See Commission Decision 2013 (<https://eur-lex.europa.eu/legal-content>)

⁴ See Commission Decision 2016 (<https://eur-lex.europa.eu/legal-content>)

⁵ Andrew Bailey, Chief Executive of the FCA, The Future of LIBOR. Presentation on 27 July 2017

number of these types of contracts are now pledged and cleared to a central counterparty, a risk-free reference rate would be more suitable.

In 2016, EU Benchmarks Regulation entered into force. The new rules went into effect on 1 January 2018. The regulation places requirements on administrators, contributors and users of benchmarks. There is a separate appendix for reference rates that contains requirements on internal governance and control and the management of conflicts of interests for administrators and contributors. According to the regulation, the data that serves as a basis for a reference rate should be prioritised as follows:

1. Transactions in the underlying market the reference rate intends to measure. If these are not sufficient, transactions in related markets should be used.
2. Observations of third-party transactions.
3. Committed quotes.
4. Indicative quotes or expert judgements.

In other words, the use of expert judgements, or the exercise of discretion according to the definition, is not forbidden under the BMR. However, the BMR places specific requirements on contributors who use this method. According to the regulatory technical standards adopted by the European Commission, contributors should have

- a framework for ensuring consistent and person-independent handling of the exercise of discretion over time;
- identified the information that may, or may not, be taken into account in the exercise of discretion; and
- procedures for the review of any use of the exercise of discretion.

According to the BMR, benchmarks should be divided into categories based on their characteristics. If the European Commission declares a benchmark to be critical within the EU or a Member State, this means that deficiencies in the benchmark could have an impact on, for example, financial stability. If a benchmark is declared to be critical, the supervisory authorities are granted extra powers to administer the benchmark. The purpose of the mandate is primarily to ensure that the publication of the benchmark is not terminated in a disorderly fashion. Supervisory authorities within the EU may require an administrator of a critical benchmark to continue its publication for up to 24 months after the administrator has announced the benchmark's cessation. Contributors may also be ordered to continue to submit for a critical benchmark. FI has assessed STIBOR and come to the conclusion that it is a critical reference rate in Sweden. The European Securities and Markets Authority (ESMA) shares this assessment, and on 17 October 2018 the European Commission made STIBOR a critical benchmark. STIBOR joins LIBOR, EONIA and EURIBOR on the list of the Commission's critical benchmarks. The others are considered to be critical for the entire EU, while STIBOR is considered to be critical for Sweden.

In previous legislation, market manipulation of benchmarks has not been expressly forbidden in Sweden. The legislation has instead focused on the manipulation of financial instruments, for example shares and other securities. This changed when the Market Abuse Regulation

(MAR) went into effect on 3 July 2016. MAR (596/2014) expressly forbids the reporting of false inputs and other behaviour that results in manipulation of the benchmarks.

DEVELOPMENT OF ALTERNATIVE REFERENCE RATES

In 2014, a group of U.S. authorities formed the Alternative Reference Rates Committee (ARRC)⁷ to develop a new reference rate to replace US Dollar LIBOR. The committee members include representatives from several global investment banks, the International Swaps and Derivatives Association (ISDA) and LCH Clearnet. The U.S. Securities and Exchange Commission (SEC) sits on the committee as an observer together with the initiative-takers.

One of the sub-goals of the ARRC has been to develop an alternative reference rate that is transaction-based and fulfils the IOSCO's principles for benchmarks as well as the FSB's recommendations. ARRC has held roundtable discussions on two occasions with institutions and market participants not represented on the committee to discuss challenges related to switching reference rates and which interest rate is appropriate to switch to.⁸ ARRC announced in 2017 that it advocates using an overnight rate based on repo transactions – Secured Overnight Financing Rate (SOFR) – as its reference rate. The Federal Reserve Bank of New York is responsible for calculating and publishing SOFR. This reference rate was first published in April 2018. In May, the Chicago Mercantile Exchange introduced SOFR futures. Since then, for example, the World Bank has issued bonds that use SOFR as the underlying reference rate.

In 2015, Great Britain appointed a working group of private companies and institutions, including representatives from the large British banks, London Stock Exchange Group, the ISDA and LCH Clearnet. The Bank of England (the central bank) and the FCA (the financial supervisory authority) are observers in the steering group.

Two of the objectives for the group have been to identify a robust and reliable alternative reference rate and develop a plan for how to transition away from LIBOR. As mentioned above, the FCA announced in 2017 that it does not intend to support LIBOR after 2021.

The working group presented a proposal for how to switch to an updated version of the reference rate Sterling Overnight Index Average (SONIA). The Working Group on Sterling Risk-Free Reference Rates (2017). SONIA is based on unsecured overnight rates. The Bank of England has been calculating and publishing SONIA since April 2018. The European Investment Bank and others have issued bonds that use SONIA as the reference rate.

In September 2017, ESMA, the European Central Bank (ECB), the European Commission and the Belgian supervisory authority Financial Services and Markets Authority (FSMA) appointed a new working group to develop an alternative reference rate for the euro zone. The private organisation European Money Markets Institute

⁷ The initiative was taken by the Board of Governors of the Federal Reserve System and Federal Reserve Bank of New York with support from the U.S. Department of the Treasury, the U.S. Commodity Futures Trading Commission (CFTC) and the Office of Financial Research (OFR).

⁸ More information is available on the ARRC's website: www.newyorkfed.org/arrc

(EMMI) had already attempted to reform EURIBOR by having the reporting only be based on transaction data. However, EMMI announced in May 2017 that it would not be continuing with the reform since it was not considered feasible given the current market conditions. EMMI has instead continued to work with a hybrid model for EURIBOR that uses a method supported by transactions to the greatest extent possible and uses other relevant market sources for the market's price-setting when necessary. This work must be finished in 2019 if EMMI is to have time to submit an application to have EURIBOR approved as a reference rate before the transition period for the exemption in the BMR expires on 1 January 2020.

EMMI has also expressed that it is probably not possible to have the current form of EONIA authorised under the BMR, and the new working group has therefore recommended a new overnight rate, the Euro Short-Term Rate (ESTER). This reference rate will have larger transaction volumes since more banks can contribute to the reporting than what is currently the case for EONIA. The ECB is responsible for developing and administering ESTER and intends to start publishing the reference rate in October 2019.

Table 1 below shows an overview of the work to develop alternative reference rates in various countries.

Table 1. Development of alternative reference rates.

	Proposed reference rate	Administrator	Covered	Transaction source	First publication date	Working group
	ESTER ¹	European Central Bank (ECB)	No	Unsecured overnight transactions.	Launch date planned for October 2019.	Working group appointed.
	Reformed SONIA ²	Bank Of England ²	No	Unsecured overnight transactions.	23 April 2018	The Working Group on Sterling Risk-Free Reference Rates
	SARON ³	SIX Exchange	Yes	CHF repo transactions on the interbank market	Published today but discussion continues on whether SARON can replace CHF LIBOR.	National Working Group on Swiss Franc Reference Rates
	SOFR ⁴	Federal Reserve Bank of New York	Yes	Third-party repo, FIIC GCF repo and FICC bilateral treasury repo.	3 April 2018	Alternative Reference Rates Committee (ARRC)
	TONAR ⁵	Bank of Japan	No	Data is provided by money market brokers.	Published today and the working group is working to improve TONAR.	Study Group on Risk-Free Reference Rates

Note: ¹Euro Short-Term Rate. ²Sterling Overnight Index Average. ³Swiss Average Rate Overnight. ⁴Secured Overnight Financing Rate. ⁵Tokyo Overnight Average Rate.

SWITCHING REFERENCE RATES IS A MAJOR CHALLENGE

In the countries that have progressed the most in the transition to an alternative transaction-based interest rate, the work is now entering into the next phase. This phase will include in particular how the

actual switch to the new reference rates will occur. ISDA (2018) estimates that there are financial products and contracts with an outstanding volume of around USD 370 billion linked to a reference rate. This represents major challenges for the industry and complex questions will arise in conjunction with the transition, for example how contracts based on LIBOR that have maturities that extend beyond 2021 should be handled. Should these run to maturity or should the reference rate that is linked to existing contracts be changed? The financial consequences of switching a reference rate can be considerable, and the issue of compensation may arise.

The characteristics of the alternative reference rates differ from the old rates. Because one of the aims of alternative reference rates is to be transaction-based, they have very short maturities. They use overnight rates since this is where there is a sufficient volume of transactions. This means lower credit risk than loans with longer maturities (for example a maturity of three months). The new alternatives do not have the credit risk element that is present in traditional reference rates. This could be an advantage for borrowers since their own financing cost will be less dependent on the banks' funding cost, but it could also be a disadvantage for the customers if the banks compensate themselves for the increased uncertainty about how profitable the transaction is for them.

The short maturities of alternative reference rates mean that market participants' cash flows might become less predictable. When it comes to reference rates with longer maturities, a borrower or issuer knows what the interest rate payment up to three months, for example, will be. If an interest rate payment will be based on an alternative reference rate, the interest rate will therefore need to either be settled daily or set as an average over a longer period of time. The latter means that it will not be clear until payment what the final interest rate payment will be.

The USA and Great Britain have created a derivative market for their respective alternative reference rates to handle this problem. A derivative market allows the market participants to establish a price for what the average reference rate is expected to be over a certain period, for example three months. Participants that need predictable cash flows can then use the derivative market to secure their interest rate expenses.

A transition to alternative reference rates could mean higher risks for individual financial institutions and the market's way of working during the transition phase itself. In a worst-case scenario, the financial stability may be threatened. The transition therefore needs to occur in an orderly manner. For example, the ARRC has laid forth a plan for how to transition from US Dollar LIBOR to SOFR. This plan runs from 2018 to 2021 and contains a number of gradual steps to build up a functional dollar market with SOFR as the underlying reference rate.

Developments in Sweden

STIBOR has existed since 1986 and been given an increasingly central role in the Swedish securities market. STIBOR should reflect an average of the interest rates at which banks are willing to lend to one another without collateral at different maturities. The definition of STIBOR thus differs from the definition of LIBOR, which should represent an average of what the panel banks estimate is the interest rate they would be charged when borrowing without collateral at different maturities and in different currencies.

STIBOR is used as a reference rate in many different types of financial contracts. In 2017, the reference rate served as a basis for the following:

- Interest rate derivatives with an outstanding amount of around SEK 43,000 billion.
- Financial institutions' loans to Swedish firms and households with a variable interest rate at an outstanding amount of around SEK 4,000 billion.
- Bonds with a variable rate at an outstanding amount of around SEK 800 billion.

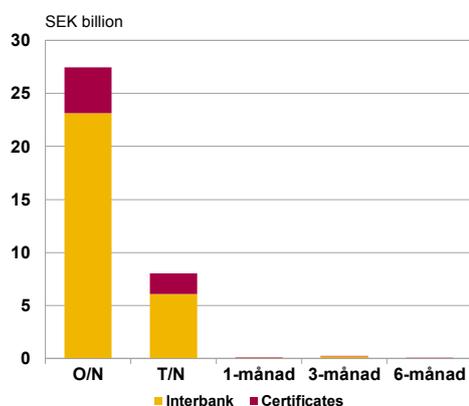
In addition to the above contracts and financial instruments, which are directly linked to STIBOR, STIBOR is also used for setting prices of currency derivatives. The outstanding amounts in currency derivatives are around SEK 14,000 billion. In total, STIBOR is used as a reference rate and as a basis for loans and financial contracts at an outstanding amount of around SEK 60,000 billion.⁹

Since 2013, the calculation of STIBOR has been more transparent. This is a direct result of the IOSCO's principles and measures, which began to be applied after the Riksbank's extensive investigation into STIBOR in 2012. The purpose of the investigation was to identify any deficiencies in the framework and assess the conditions for being able to verify STIBOR against market prices. As a result of the work, the Swedish Bankers' Association took on the role of principal with overall responsibility for STIBOR.

The STIBOR banks consist today of Danske Bank, Handelsbanken, Länsförsäkringar Bank, Nordea, SBAB Bank, Skandinaviska Enskilda Banken (SEB) and Swedbank. It is worth noting that the number of panel banks for STIBOR increased from six to seven when SBAB joined in 2016. The Association's Board of Directors appoints members and personal deputies to the STIBOR committee. The committee is responsible for the framework and following up how it is applied. The framework aims to ensure that there is a structure for governance and control and that the process for determining the interest rate is transparent. The committee consists of representatives from all of the STIBOR banks, Fastighetsägarna Sverige, which is an alternate member, and Irma Rosenberg, a previous Deputy Governor

⁹ The amounts are based on nominal amounts for financial contracts, not market values. It is also a gross amount, which means that the nominal amounts for liabilities and assets are summed. The amount includes mortgages and corporate loans at variable rates, bonds with variable rates and interest rate swaps, interest rate forwards and currency swaps. Source: Bank for International Settlements (BIS) 2017-06-30, Statistics Sweden (SCB) 2017-06-01 and Bloomberg 2018-03-15

Diagram 2. Average daily volume on the interbank-market in 2017.



Source: The Riksbank and FI calculations.

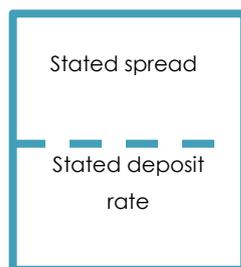
of the Riksbank. The Riksbank, Nasdaq and the Swedish Bankers' Association participate as observers.

FRAMEWORK FOR STIBOR

STIBOR is determined by the STIBOR banks, which report their STIBOR contributions (interest rates) for the maturities of an investment from next day to tomorrow/next, one week, one month, two months, three months and six months, respectively. The banks submit their STIBOR contribution every business day for all maturities. The reference rate is compiled by Nasdaq, which calculates and publishes STIBOR. The STIBOR contribution should represent the interest rate the bank requires to lend to another STIBOR bank without collateral.

The banks' STIBOR contributions are based on a deposit rate plus a spread, which according to the STIBOR framework may be set by each bank. The framework also requires the STIBOR banks to document all interest rates that serve as a basis for their contribution. Even the loans and investments made within the framework of the STIBOR banks' commitment to trade with one another at their stated STIBOR contribution should be documented.

Figure 1. Component in the individual banks' STIBOR contribution



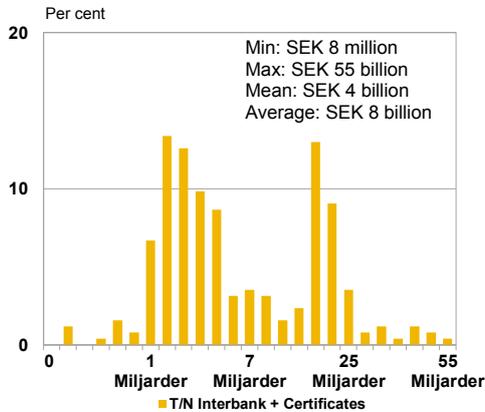
Each individual bank should follow these guidelines when submitting their STIBOR contribution:

- **First:** An interest rate used in an actual transaction with another bank. The loan should be without collateral and in SEK.
- **Second:** An indicative interest rate the bank believes it can borrow at and offer to another bank in SEK. It does not need to be based on an actual transaction. The bank can also estimate the STIBOR contribution using a basket of issued certificates⁹ in SEK and issued certificates in EUR or USD that have been transformed into SEK via currency swaps.¹⁰ There is no requirement on actual transactions for commercial paper; banks may use the rates at which they are prepared to issue commercial paper. According to the STIBOR framework, at least 50 per cent of the STIBOR contribution

⁹ Normally called funding through commercial paper for borrowing, but in this analysis only the terms *deposit* and *deposit rate* are used.

¹⁰ The deposit rate in foreign currency is recalculated using the interest rate parity given by currency swaps at a corresponding Swedish interest rate. Each bank is free to decide the weights of each currency as long as the total does not exceed 50 per cent of the basis.

Diagram 3. Daily deposit and lending volumes, including issued commercial paper, 2017.



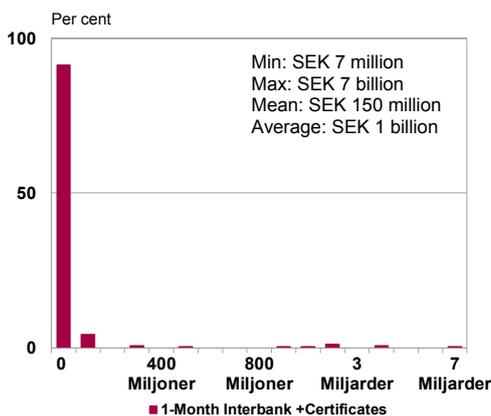
Source: The Riksbank and FI calculations.

Note: Refers to the period 1 January–31 December 2017.

The transactions consist of reporting deposits and lending to financial counterparties and issued commercial paper.

Transactions with the Riksbank are excluded, but transactions with the Swedish National Debt Office are included. One month is defined as 20–40 days, 3 months as 70–110 days and 6 months as 150–210 days. Interbank transactions do not occur daily. There were 22 (13 commercial papers) unique dates with a one-month maturity during the period, 39 (7 commercial papers) unique dates with a three-month maturity and 5 (1 commercial paper) unique dates with a six-month maturity.

Diagram 4. Daily deposit and lending volumes, including issued commercial paper, 2017.



Source: The Riksbank and FI calculations.

Note: Refers to the period 1 January–31 December 2017.

The transactions consist of reporting deposits and lending to financial counterparties and issued commercial paper.

Transactions with the Riksbank are excluded, but transactions with the Swedish National Debt Office are included. One month is defined as 20–40 days, 3 months as 70–110 days and 6 months as 150–210 days. Interbank transactions do not occur daily. There were 22 (13 commercial papers) unique dates with a one-month maturity during the period, 39 (7 commercial papers) unique dates with a three-month maturity and 5 (1 commercial paper) unique dates with a six-month maturity.

must be based on interbank loans and issued certificates in SEK.

At least four STIBOR banks must submit STIBOR contributions for STIBOR to be calculated and published. If there are six or fewer STIBOR banks, all are included in the calculation. If there are seven – as there are today – or eight STIBOR banks, the highest and lowest contributions are removed before the calculation. If the number of STIBOR banks increases to nine or more, the two highest and lowest contributions are removed before the calculation.

LOW TRANSACTION VOLUMES ON THE INTERBANK MARKET

Just like in several other countries, activity on the Swedish interbank market for unsecured deposits and loans in SEK is low. The large volumes are limited to transactions with very short maturities between banks (see Diagrams 2–6). There were no transactions at all in 2017 for more than 90 per cent of the trading days for some maturities. For STIBOR 3M, which is the most central maturity on which most of the outstanding contracts are based, there were no interbank transactions in SEK for just under 90 per cent of the trading days. The transactions that were conducted were also relatively small, with a mean of SEK 620 million.

Because there are basically no actual transactions for the longer maturities, the banks tend to use the framework’s second alternative (see above) when calculating their contribution. This means, in turn, that STIBOR for the longer maturities is in part dependent on the currency swap market’s pricing and the prevailing funding levels in each currency.

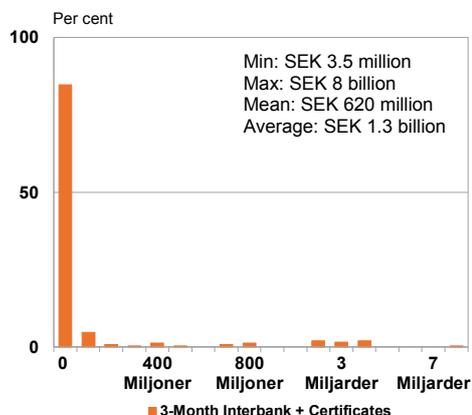
Challenges moving forward

Many jurisdictions have given up trying to strengthen existing reference rates in the manner that FSB envisioned. It is therefore clear that a large number of contract types need to switch to a new reference rate. As a result, in order to strengthen the integrity of a reference rate, it may be necessary to renounce some of the features of the traditional reference rates. This means in turn that firms may need to change the way they manage their financing and risks.

Many countries have progressed quite far in their processes for developing new reference rates. The initiatives to replace the current reference rates have been largely taken to avoid manipulation. In an effort to rectify these problems, a consensus has been reached in all cases to use transaction-based reference rates on short maturities. These reference rates are relatively well-suited for use in interest rate derivatives, but they are not a perfect fit for use in other types of contracts. For example, borrowers and lenders will not be able to easily gather information about their future interest rate payments due to the underlying short maturity. Another aspect is that the interest rates do not include a measure of credit risk.

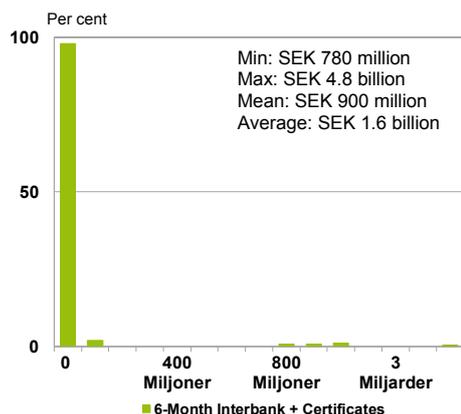
In Sweden there have not yet been any official initiatives to reform STIBOR or develop new alternative reference rates. This lack of initiative may be because the participants are not experiencing the same need for change. For example, the number of panel banks for STIBOR has increased, unlike the number of panel banks for LIBOR and EURIBOR. Another explanation may be difficulties in identifying

Diagram 5. Daily deposit and lending volumes, including issued commercial paper, 2017.



Source: The Riksbank and FI's calculations.
 Note: Refers to the period 1 January–31 December 2017.
 The transactions consist of reporting deposits and lending to financial counterparties and issued commercial paper. Transactions with the Riksbank are excluded, but transactions with the Swedish National Debt Office are included. One month is defined as 20–40 days, 3 months as 70–110 days and 6 months as 150–210 days. Interbank transactions do not occur daily. There were 22 (13 commercial papers) unique dates with a one-month maturity during the period, 39 (7 commercial papers) unique dates with a three-month maturity and 5 (1 commercial paper) unique dates with a six-month maturity.

Diagram 6. Daily deposit and lending volumes, including issued commercial paper, 2017.



Source: The Riksbank and FI's calculations.
 Note: Refers to the period 1 January–31 December 2017.
 The transactions consist of reporting deposits and lending to financial counterparties and issued commercial paper. Transactions with the Riksbank are excluded, but transactions with the Swedish National Debt Office are included. One month is defined as 20–40 days, 3 months as 70–110 days and 6 months as 150–210 days. Interbank transactions do not occur daily. There were 22 (13 commercial papers) unique dates with a one-month maturity during the period, 39 (7 commercial papers) unique dates with a three-month maturity and 5 (1 commercial paper) unique dates with a six-month maturity.

what will replace the established reference rate. It is still probable, though, that Sweden will need to follow the trend. If the rest of the world and markets that are important for the financing of Swedish firms change their conventions, Sweden will probably not be able to stand by and watch.

The EU Benchmarks Regulation (BMR) will naturally require both further enhancements to the framework around STIBOR and a move to primarily transaction-based information as a basis for the reference rate. Like in other countries, Sweden suffers from a lack of transaction data (see Diagrams 2–6). However, the BMR still allows contributors to use discretionary assessments, but this will require methods for overview and verification to ensure that these discretionary assessments are accurate.

The process of replacing an established reference rate with a new reference rate is complicated and risky. The new reference rate must have gained wide acceptance before market participants are able to begin using it for contracts. Sweden needs to learn from other initiatives. Given that Swedish firms need to adapt to changes in other countries, it is possible that the acceleration lane for STIBOR's alternative does not need to be very long. However, it is important to thoroughly review STIBOR's areas of use to identify the risks that could arise from changing the reference rate.

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