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LIBOR Transition:

The biggest challenge to face the financial industry

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Introduction

The London Inter-bank Offered Rate (LIBOR) is a benchmark interest rate at which major global banks lend to one another in the international interbank market for short-term loans. It is a globally accepted benchmark interest rate that indicates borrowing costs between banks. It is also the reference interest rate for tens of millions of contracts worldwide which amount to over \$200 trillion in notional. These include forward rate agreements, interest rate swaps, interest rate futures and options, floating rate certificate of deposits and notes, syndicated loans, individual mortgages and student loans. It is published every day in five different currencies (USD, EURO, CHF, JPY, GBP) and for seven different time frames (overnight, one month, three months, six months, nine months, twelve months).¹

History

Minos Zombanakis is considered the “father of LIBOR” after developing an interest rate strategy for an \$80 million loan for the government of Iran. The loan was one of the first to charge a variable rate of interest, one that reflected the changing market conditions. Banks were not comfortable in lending at fixed rates for long durations, especially to a developing country without appropriate foreign reserves. Zombanakis figured out a way to finance the Iranian central bank by dividing the risk among multiple banks and creating a mechanism to charge variable interest rates. Soon the syndicated loan market caught on and by 1982 it had ballooned to \$46 billion using LIBOR.² Zombanakis had no idea that it would soon be adopted as an elegant proxy for bank borrowing costs. In the 1970s, pegging contracts to LIBOR became increasingly common and was known as a floating-rate note.

As financial markets became increasingly complex, Libor transformed from a tool used to price individual loans and bonds to a global benchmark for derivatives deals worth hundreds of billions of dollars, primarily in interest-rate swaps, where it was used to mitigate risks of fluctuating interest rates.

In 1984, the British Bankers’ Association (BBA) began consultation with the Bank of England (BoE), amongst others, on how such a benchmark should be regulated. By 1986 the rate was published by the BBA in GBP, USD and JPY. The BBA tweaked the formula to exclude outliers from the calculation in an effort to discourage and prevent manipulation.² The submission process soon became electronic and expanded to more

currencies. However, it was its adoption by the Chicago Mercantile Exchange (CME) as the reference rate for Eurodollar futures contracts that cemented its position at the heart of financial markets.

LIBOR Scandal: Panel Submission Fraud

As the benchmark reference for interest rates on consumer and corporate loans, LIBOR is tied to trillions of dollars in securities and loans including government and corporate debt, student loans and home loans. A manipulation of this rate would have cascading implications. An investigation that began in 2012 brought to light the collusion of banks (including Deutsche Bank, Barclays, UBS, Rabobank, and the Royal Bank of Scotland) to rig LIBOR.

Banks submitted the rates to provide figures that would benefit the traders, instead of submitting the rates the bank would *actually pay* to borrow money. Some have even colluded and coordinated with other banks to alter rates, further manipulating LIBOR and reaping larger profits. During the onset of the global financial crisis, a few banks maneuvered LIBOR downwards by reporting relatively inexpensive rates to insulate themselves.

The scandal has eroded public trust in the marketplace and has led to settlements of over \$35 billion in addition to fines levied on participating banks. This has made it more difficult for the banks to maintain required reserves at a time when legal requirements are more vigorous to prevent another global systemic crisis. In response to the LIBOR scandal, regulatory authorities have taken to, not only, reforming the submission process, but also in transitioning away from LIBOR.

LIBOR Transition

In 2017, Andrew Bailey, Chief Executive of the Financial Conduct Authority (FCA) delivered a speech regarding LIBOR Transition. He emphasized the importance of a global departure away from LIBOR starting now. He discussed how the ICE Benchmark Association (IBA) has considered tying the rate to a wholly transaction-based process, rather than a judgement-based one, to ensure that it most accurately resembles actual market conditions.⁴ Yet this proved to be a difficult task, not because banks were non-compliant, but instead due to the low-volume of unsecured interbank transactions upon which the rate is based on.

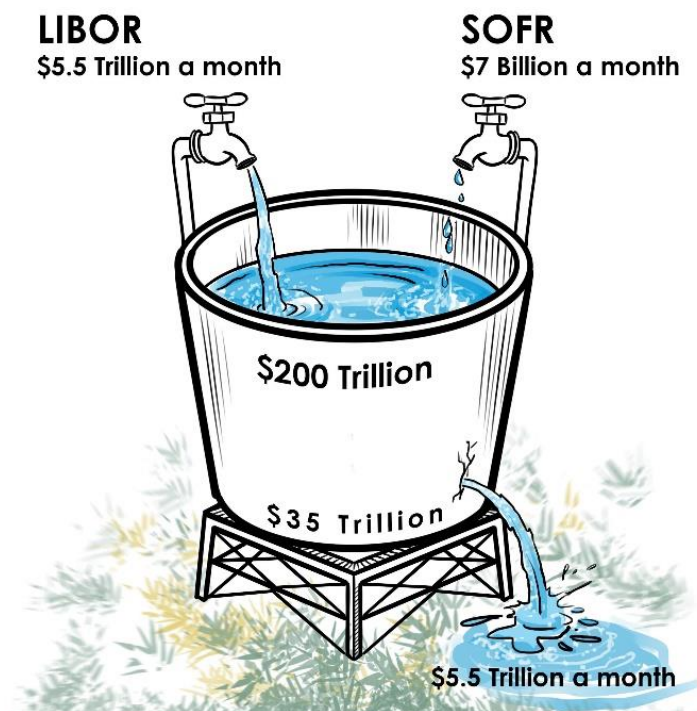
Data from the IBA shows that only a few of the eligible banks borrow or lend with other banks at any of the LIBOR tenors. ⁴ In fact, the Federal Reserve estimates there are only about 6-7 transactions per day on 1-month and 3-month tenor, 2-3 on 6-month tenor, and 0-1 on 1-year per day, yet these tie up over \$500 million worth of contracts⁵. These low volume, high magnitude characteristics of LIBOR raise a critical question - how can a benchmark be a best-fit for the market, if it is not grounded in prevailing market conditions?

Thus, Bailey and the FCA, through coordination with the panel banks, established that LIBOR submission will no longer be necessary past 2021.⁴ LIBOR must not be immediately discontinued or simply replaced due to the sheer number and weight of financial contracts tied to it. Hence, he is impelling financial institutions and regulatory authorities across the world to adopt new alternative rates that are best suited for their home countries. Transition existing contracts to these rates while simultaneously terminate the use of LIBOR in long-term contracts.

Stop Using LIBOR NOW!!

If a LIBOR crisis were to occur, it would have the possibility of being even more disastrous than the financial crisis of 2008. With approximately \$200 trillion of US-based contracts (with 95% tied to derivatives), the potential for losses would be enormous.⁶ Of this \$200 trillion, however, only about 18% or approximately \$35 trillion mature after 2021. This is an estimate of the exposure of US Dollar contracts that need to be rewritten during LIBOR transition. To meet the 2021 deadline to rewrite these LIBOR contracts, approximately \$1.2 trillion worth of contracts need to be rewritten each month. However, under current market behavior, this exposure is actually increasing. New contracts tied to LIBOR are being written at approximately \$5.5 trillion a month, using data from 2018. In contrast, only about \$7 billion worth of US dollar

contracts are written using SOFR, one of the ideal alternatives for LIBOR in the United States. This is a fraction; nearly one 1,000 times smaller than the amount of new contracts tied to LIBOR and is therefore only inhibiting the possibility of a successful LIBOR transition by the 2021 deadline.



The only way to manage the LIBOR exposure on the date of cessation is to immediately abandon the use of LIBOR as a benchmark in contracts maturing past 2021 and replace it with a suitable alternative. The Federal Reserve has tasked the Alternative Reference Rates Committee (ARRC) with this responsibility. At an ARRC Meeting on June 4, 2019, David Bowman, Special Advisor to the Board of Governors of the Federal Reserve, vigorously said “Stop Using LIBOR, Stop Using LIBOR, Stop Using LIBOR”. His emphasis on an immediate cessation of writing LIBOR-based contracts is due to the same conclusion as the figures have shown. To reduce the exposure of long-term LIBOR contracts, new contracts must be written referencing an alternative rate other than LIBOR.

Take the example of the Federal Aviation Association (FAA) mandating all plane manufacturers to stop using a certain plane part by 2021 on all new planes. But also to replace this part all the existing planes. Manufacturers would obviously stop using the obsolete part immediately and will work the grace period to replace the old part in all pre-existing planes. It would be inefficient, risky, and costly to not change the old part in

the production of new planes and to delay replacing them until the deadline. Similarly, Bowman and others, reiterate that the continued use of LIBOR today only makes LIBOR transition increasingly difficult, whereas halting the use of LIBOR and switching to an alternative today would ease the process.

Change your engine now



LIBOR is managed by the FCA and BBA in the UK, but serves as the global benchmark for currencies and securities around the world. Whereas the UK will be turning to SONIA (Sterling Overnight Index Average) as a reference rate alternative, other countries and unions will need to find their own alternative suitable for them. As aforementioned, the Fed had designated the task of finding a new US alternative to ARRC, who recommends SOFR (Secured Overnight Funding Rate). ARRC's membership is comprised of multiple private sector market participants, official regulatory authorities, and overseers. In addition, there are 10 working groups representing each organizational discipline to achieve goal-specific objectives, facilitating LIBOR Transition.⁷ Through consultation with industry leaders, ARRC is providing the public with [crucial resources](#) on how to achieve successful LIBOR

transition. Yet, their recommendations are rendered futile unless companies put them into immediate action.

Executives in financial institutions and other companies need to heed Bowman’s warnings and prevent their organizations from continuing to use LIBOR. A shock in the security-writing culture needs to be administered, as to alter the public perception and to dismiss critics and skeptics of the LIBOR transition deadline, perhaps by following in the footsteps of ARRC member J.P. Morgan. They have spearheaded efforts to switch from LIBOR to SOFR, by dealing the first ever SOFR-based municipal bond, issuing \$800 million worth of SOFR-linked debt, and swapping the first benchmark sized fix rate issuance to SOFR.⁸ A longtime financial titan, J.P. Morgan has set an example for the rest of industry which need not delay in transitioning to alternative rates.

Challenges

LIBOR Transition is a complex quandary that will require an exhaustive procedure to mitigate risks of potential losses. Across the industry, an organizational-wide effort as well as customer engagement is necessary to ensure efficiency and discipline in the transition process:

Exposure	Revision	Outreach	Booking	Compliance	Finance	Analysis
Impacted Portfolio Exposure Realization and Analysis	Revised Offering / Risk-Rating and Underwriting	Customer Outreach to Ease Transition Experience	Appropriate Updating of Booking and Other Systems	Ensuring Compliance Integrity and Proper Reporting of Changes	Reporting of Tax, Fair Value, and Accounting Adjustments	Portfolio Analysis, Collections, and Subsequent Reporting

Reference Rates

What Are the Alternatives?

While LIBOR is published in multiple currencies daily, and used as a global benchmark, reformers are now switching to separate reference rates for major currencies. The following rates are currently the primarily-accepted alternative reference benchmark rates:⁹



Currency	USD	GBP	EUR	CHF	JPY
Reference Rate	Secured Overnight Funding Rate (SOFR)	Sterling Overnight Index Average (SONIA)	Euro Short-Term Rate (ESTER)	Swiss Average Rate Overnight (SARON)	Tokyo Overnight Average Rate (TONA)
Working Group	Alternative Reference Rates Committee (ARRC)	Working Group on Sterling Risk-Free Rates	Working Group on Euro RFR	National Working Group on Swiss Franc Reference Rates (NWG)	Cross-Industry Committee on JPY Interest Rate Benchmarks
Administrator	Federal Reserve Bank of New York	Bank Of England	European Central Bank	SIX Swiss Exchange	Bank of Japan
Secured or Unsecured	Secured (Repo)	Unsecured	Unsecured	Secured (Repo)	Unsecured
Effective Date	April 2018	April 2018	October 2019	August 2009	November 1997
Liquidity	Low But Growing	Relatively High	None	Very Low	Very Low

SARON based on transaction and binding quotes, all others fully transaction-based

Another alternative benchmark in the United States is AMERIBOR, or the American Interbank Overnight Rate. It is published by the American Financial Exchange (AFX) and reflects the actual interbank costs of overnight, unsecured borrowing for American banks through the AFX online platform.¹⁰ Whereas LIBOR reflects the rates *reported* by the bankers, AMERIBOR reflects the *actual transaction* rates used in the trading platform. Bid and offer rates are anonymously posted, and then either approved or declined by the other banks. The published rate is then determined by the level of rates used in executed trades. There are, on average, 60 banks trading \$2.5 billion worth of transactions per day, providing liquidity and establishing AMERIBOR in true market conditions.⁵ However, while AMERIBOR does present benefits as a lender's benchmark, ARRC and the major players of financial industry in the United States seem to recommend SOFR as the appropriate LIBOR alternative moving forward.

Is SOFR the Solution?

ARRC, who was instructed by the Federal Reserve Bank of New York (FRBNY) has consistently recommended the Secured Overnight Financing Rate (SOFR), which measures the cost of borrowing overnight cash with U.S. Treasuries as collateral, known as the repurchase market. When banks are under their required daily cash reserves threshold, they must borrow from those with excess reserves to meet it. They pay a small premium for the borrowing, and return the funds the next day, hence why it is a "secured" and "overnight" rate. Transactions with rates below the 25th volume-weighted percentile are trimmed, to reduce the impact of outliers.⁵

Other market participants also use SOFR for borrowing and lending, and it therefore serves as a viable benchmark replacement for LIBOR. SOFR is supported by 370 transactions a day on average, much more than average number of daily LIBOR transactions, yet SOFR deals are not linked to as much capital as LIBOR deals.¹¹ This contributes to a trend of volatility in SOFR's daily rates, as the high volume of transactions can be linked to greatly different amounts of capital each day. Yet, since SOFR is based on numerous actual transactions in the repurchase market where funds are immediately returned, it acts as a virtually risk-free rate. LIBOR, on the other hand, has an inherent credit-risk implication stemming from the panel submissions incorporations of default in the rate submissions. This creates a dilemma for buyers of different financial instruments, lenders and security buyers prefer LIBOR as it accounts for credit risk, yet derivatives traders prefer the risk-free nature of SOFR.⁵

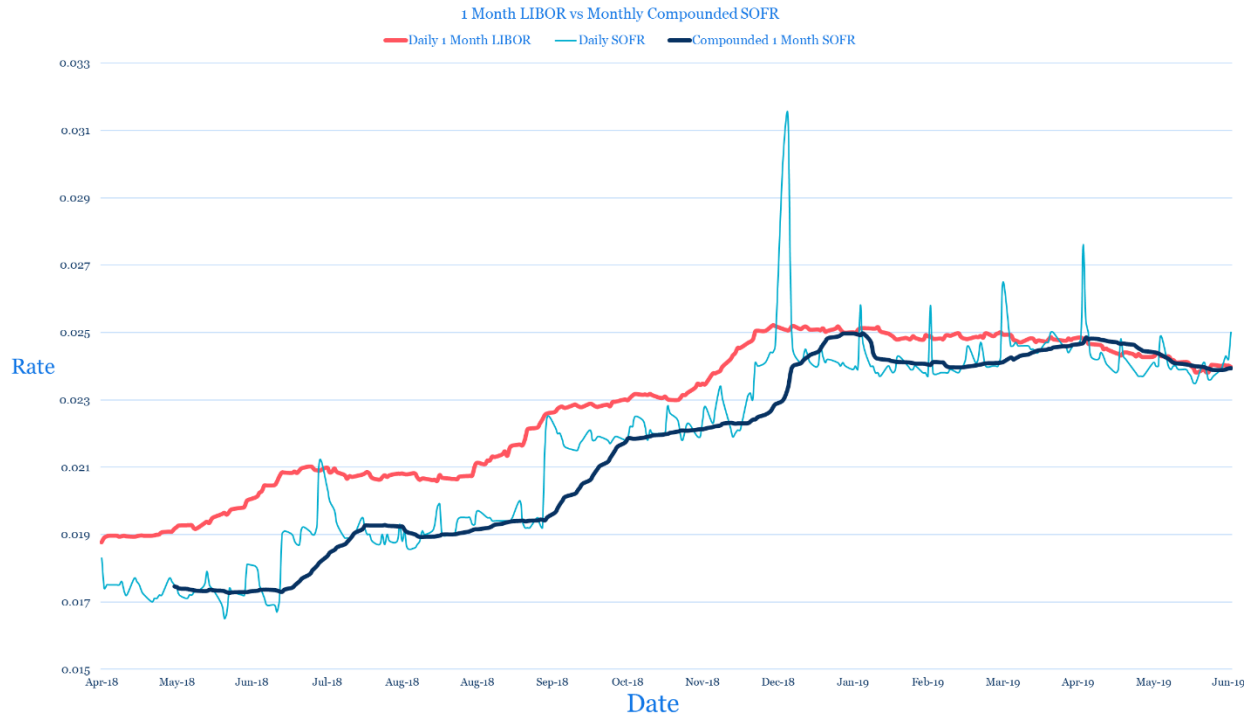
SOFR is still relatively new in regards to LIBOR, but it is imperative that financial institutions and other firms switch from LIBOR to SOFR promptly if they have not

already to avoid any operational risk from not meeting the 2021 deadline. Major differences between SOFR and LIBOR are highlighted below:

SOFR v LIBOR

SOFR	LIBOR
Secured	Unsecured
Purely Transaction-Based	Survey-Based
History of Volatility	History of Manipulation
Risk-Free (no credit risk component)	Risky (contains credit risk component)
No Published Long-Term Rate	Multiple Published Long-Term Rates
Low Liquidity	High Liquidity
1 Currency (USD)	5 Currencies (USD, GBP, EUR, CHF, JPY)
Relatively Low Usage	Relatively High Usage
Accounting Systems in Development	Accounting Systems already Developed

The chart below shows how 1 month compounded SOFR has tracked 1-month LIBOR. You will see that with the passage of time the two rates have tracks closely, even though there are clear spikes in the violent spikes in the daily SOFR rates.



Risks

Perhaps the reason why the public has been reluctant to switch to SOFR are the perceived risks SOFR has that LIBOR does not, yet these risks can be effectively managed with a cooperative industry effort. Unlike LIBOR, SOFR currently lacks: liquidity in the market, a credit-risk component, and published long-term tenor.

Credit Risk

The LIBOR scandal would have been preventable if the credit-risk implication in panel bank submission was non-existent, and if LIBOR was transaction-based and risk-free, like SOFR. Since SOFR is based off the treasury repurchase market it is inherently secured and thus risk free. Lenders who require a level of credit risk in their security offerings are therefore reluctant to switch to SOFR. Yet, overlaying SOFR with some risk-based delta, such as Investment Grade (IG) from the Credit Default Swap Index (CDX), can form a credit-sensitive lending index, that also mirrors the trend of respective LIBORs.

This combined rate is a form of SOFR with a credit risk implication, thus providing lenders with no incentive to maintain the use of LIBOR.⁵

Liquidity

A significant concern for lenders and borrowers using SOFR is the lack of liquidity of the SOFR-tied securities market. Yet, this is primarily due to relatively low usage of the rate, and as transaction volume increases, liquidity in the market will subsequently develop. Similarly, as LIBOR transition continues, liquidity will begin to thin in the LIBOR market and should discourage the use of the benchmark as the 2021 deadline is approached.¹¹ In addition, taking positions referencing risk free rates will have balance sheet implications for certain companies, yet they may not even need the immediate liquidity as the rates are risk-free.

In times of market stress however, regulators need to provide transparency in market liquidity conditions and corral large banks into committing to provide liquidity in the market, potentially by incentivizing the “first-mover” advantages of banks receiving favorable terms if they are among the early institutions to pledge liquidity.¹² SOFR is not as popular as LIBOR in the overall securities market, yet SOFR futures are actively traded at the Intercontinental Exchange (ICE) and Chicago Mercantile Exchange (CME). There is \$293 billion in 1-month open positions, and \$67 billion in 3-month open positions across these markets, as of late June 2019.⁵ Transaction magnitude this significant should provide lenders and borrowers confidence in the ability of SOFR to develop liquidity as it is actively accepted as the alternative rate to LIBOR.

Long-Term Tenor

Another major difference between LIBOR and SOFR is the lack of published long term rates, as SOFR is wholly transaction-based and an overnight rate. Long-term benchmark structure in different maturities reflects expectations of how interest rates will change in the future, and long-term securities are widely traded in the market.⁸ Yet, since SOFR represents Overnight Treasury Repo rate, term rates can be represented by term treasury repo. By the “no-arbitrage” principle, the present value of term repo cash flows must be therefore equal to the equal term treasury security cash flows, henceforth, term SOFR is essentially a

treasury security of equal maturity.⁵ Using this logic, FRBNY plans on publishing multiple term SOFR rates in the future. Evidently, the SOFR Futures market proves to be fundamental again. 1-month Fed Funds (an unsecured, overnight borrowing rate), tracks almost perfectly with 1-month SOFR Futures (SOFR futures are slightly higher in magnitude but match the same trend). Furthermore, 3-month LIBOR curves are similarly shaped to the 3-month SOFR futures curve, with a slight spread separating LIBOR from SOFR. As aforementioned, this spread can be erased by adding a risk-based delta to SOFR. 1-month and 3-month Futures are simply calculated by:

$$\frac{[\text{Product}(\text{Daily Interest Rates Over Term}) - 1] * 360}{\text{Days in Term}}$$

Accounting

LIBOR transition impacts several categories of accounting that must be considered, such as hedge accounting, discount models, debt modification, and fair valuation.¹³ Hedge accounting requires a cash product and risk-offsetting swap to cancel out the risk of a position, but the change of rate in a such an instrument could change the risk profile, hedge probability, and future forecasts. Thus, the hedging product agreement either needs to be re-negotiated or terminated and re-issued, and the appropriate changes made to the booking systems as well. Reference rates are often used in discount models, so debt pricing and future valuations with a new rate will be impacted, and therefore also need to be recalculated.

Multiple variables of the balance sheet will be affected, so comprehensive review of accounting documents will be necessary once the rates are changed. Parties involved in the purchase and/or sale of financial instruments need to refer to the contracts of their agreements, and decide the best plan of action, yet this is no easy task.

Cessation of LIBOR before December 2021

One of the fears that many financial institutions have today is the thin liquidity that determines LIBOR. ICE may continue to publish LIBOR, but what would happen if one of the major regulators decide that the rate is not referenceable any longer if there are no interbank borrowing on consecutive days,

leaving LIBOR completely paralyzed. No financial institution is fully equipped to face that challenge today.

Contract

Starting July of 2018, many loans and securities contracts started using fallback language in the event of the cessation of LIBOR. Since LIBOR transition was not expected by everyone, fallback language may be irrelevant, unclear, or non-existent in many contracts. The parties involved must revisit their contracts to ensure no unwanted potential losses are incurred. Where fallback language is provided, and overreliance on it could cause some of these losses or change the risk profile of the agreement to either side. Rewriting and re-negotiation where necessary will take time, as both parties would require compromise on the new terms.¹²

Continuation of LIBOR post December 2021

Despite guidance from various regulators, LIBOR may continue to be published post December 2021. If that happens, will the fallback language in fact apply? Since the aggrieved party would argue that LIBOR is still available and should continue to be used in the contract.

International

LIBOR serves as the global benchmark for multiple currencies. With countries and unions now adopting their own alternative rates, the possibility for value transfer through international rate arbitrage may exist. Multiple currency contracts may also be affected, as the parties involved need to decide how to choose or modify rates across currencies.¹²

Regulatory

Until SOFR or other rates become more widely used and accepted, skeptics and critics of LIBOR transition will exist and possibly persuade the actions of others. Currently, there are only a limited amount of SOFR-based cash products, creating limited end-user need and a lack of instrument variety.

Regulators need to create and promote new securities based on these alternative benchmarks that can be traded on official platforms, as to incentivize their usage. In addition, institutions may delay transitioning as it creates an organizational headache, unless these regulators enforce the deadlines with possible penalties, while simultaneously removing incentives to maintain the use of LIBOR, such as margin requirements and tax liabilities.¹²

Conclusion

LIBOR transition will require time, effort, and other valuable resources from members of the LIBOR securities market. Such a project inherently has high operational risk, as failure to meet the deadline could lead to unwanted losses and other negative effects for an organization. The consultation of management services may be necessary to help expedite the process, yet such service providers must develop a consistent playbook on how to handle the different needs of clients. A disciplined approach to LIBOR transition will require a combination of appropriately designed pricing tools, performance analytics, governance processes, risk evaluation, and monitoring strategies. The transition period is also a once-in-a-lifetime opportunity for businesses to re-evaluate pricing strategy based on consumer needs and subsequently reprice a significant portion of their LIBOR-based portfolio and therefore create and achieve new goals in the future.¹²

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