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The Changing of the Guard (LIBOR to
SOFR) and How Both Insurers and
Regulators are Responding

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The Changing of the Guard (LIBOR to SOFR) and How Both Insurers and Regulators are Responding

Toby White, Ph.D.

IMPORTANCE LIBOR, the most common floating interest rate benchmark, is going away at EOY 2021, and is being replaced by SOFR in the U.S. However, as SOFR differs from LIBOR in several key respects, insurance companies must act quickly to prepare for a smooth transition.

OBJECTIVES We explore both the credit risk and maturity risk adjustments to make the rate transition viable, together with the fallback provisions in any legacy contracts tied to LIBOR. We also analyze the consequences of rate transition to insurance companies, as relates to their balance sheet and internal processes, while also considering the perspective of insurance regulators, both within the U.S. and internationally.

EVIDENCE Benchmark rates should ideally provide an accurate representation of interest rates without being subject to manipulation, should offer reference rates for financial contracts across a wide range of maturity terms, and should serve as a benchmark for both lending and borrowing to avoid basis risk. SOFR comes closer to satisfying these properties than does LIBOR. Greater reliance on SOFR will enhance the safety and soundness of financial institutions, like insurance companies, and support financial stability within the U.S.

FINDINGS Insurers need to update their models and systems to implement rate transition, which also includes communicating any changes to clients. Exposure to LIBOR for insurance companies varies considerably by geographic location, balance sheet structure, business model, products issued, and size. Those impacted have transition risks on both sides of their balance sheets, as both asset and liability valuation require adjustment.

Asset classes potentially tied to LIBOR include bonds (which also includes floating-rate securities and collateralized loan obligations), mortgages, contract loans, derivatives, and real estate. Upon examining annual 10-K financial statements of several large U.S. life insurers, rate transition was consistently mentioned as a significant risk factor. More specifically, it impacts estimates for both cost of capital and net investment income, the valuation, pricing, and profitability of models, and risk categories like liquidity, interest rate, trading, and operational.

On the liability side, rate transition affects insurers due to impacts on their business directly, supporting investments, and both the customers and counterparties of specific contracts. A large number of debt/lease agreements and derivative positions will require modification, which leads to a multitude of legal, logistical, and operational challenges. In particular, interest-sensitivity annuity products and both life and annuity reserves may be subject to change. Another source of exposure is vendor contracts with third-party administrators, since the borrowers may exploit any reference rate change as an opportunity to renegotiate contracts.

CONCLUSION & RELEVANCE For benchmark reform to be most successful, there must be broad market adoption of alternative risk-free rates (like SOFR). These efforts will work best if transition plans are consistent and coordinated, and if the risk management areas of affected companies can identify any firm-specific vulnerabilities when LIBOR goes away. Transition plans should include improving awareness and providing guidance to market participants, monitoring progress through surveys and information requests, outlining responsibilities and expectations, and coordinating both internal and external working groups.

The transition has already incurred great momentum (since 2018) from the supernormal growth realized in SOFR futures and SOFR-based interest rate swaps markets. This progress has provided the SOFR market with the necessary liquidity (that LIBOR recently lacked) to enable the formation of a forward-looking term structure to solidify the transition beyond 2021.

The Changing of the Guard (LIBOR to SOFR) and How Both Insurers and Regulators are Responding

Toby A. White, Ph.D., CFA, FSA*

Abstract

The London Inter-bank Offered Rate (LIBOR), the rate for which banks can borrow short-term from each other, and perhaps the most common floating interest rate benchmark, is going away, and may become obsolete by end of year (EOY) 2021. LIBOR is being replaced by the Secured Overnight Financing Rate (SOFR) in the U.S. and by other country-specific alternative risk-free rates abroad. However, SOFR differs in several key respects from LIBOR; for example, LIBOR includes credit risk, is unsecured, is based on expert judgment, and has a full-term structure, whereas SOFR is a risk-free rate, is collateralized, is based on market transactions, and has no term structure. We examine the credit risk and maturity risk adjustments needed to ease the transition, along with fallback provisions for legacy contracts tied to LIBOR. We discuss the ramifications of rate transition to insurance companies, as it relates to their assets, liabilities, and internal processes. We then consider the perspective of both U.S. and global insurance regulators while highlighting specific areas of inquiry. We conclude with an overview of general recommendations for insurers to manage these risks, along with a detailed

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discussion about whether interest rate swaps tied to LIBOR will continue to be deemed as an effective hedge for accounting and valuation purposes. I would like to give special thanks to Terri Vaughan for introducing me to this topic, and for all her support, encouragement, and mentorship throughout the various stages of this project.

I. Introduction

A. LIBOR Basics and Uses

LIBOR, established in 1969, is an estimate of the interest rate for which London banks can borrow from each other, and it became the leading international interest rate benchmark. This estimate is based upon the average rate at which panel banks can obtain unsecured funding in the London interbank market. Each panel bank must answer the following query: “At what rate could you borrow funds ... by asking for and accepting interbank offers in a reasonable market size at 11:00 GMT (Kolchin, 2019a)?” It is especially prevalent in five leading global currencies: the U.S. dollar (USD), the Euro (EUR), the Great Britain pound (GBP), the Swiss franc (CHF), and the Japanese yen (JPY)—the locations correspondent with where the panel banks can be found. LIBOR is produced across seven maturities (overnight, 1 week, 1 month, 2 months, 3 months, 6 months, and 12 months), and is administered by the Intercontinental Exchange (ICE) Benchmark Administration (IBA), which is now regulated by the United Kingdom (UK) Financial Conduct Authority (FCA).

As of late 2018, exposure to USD LIBOR, as estimated by the Alternative Reference Rates Committee (ARRC), was about \$200 trillion (Cain et al., 2018), while global exposure may exceed \$400 trillion (Garritt & Devlin, 2018). The largest asset classes referencing LIBOR are derivatives (both over-the-counter and exchange-traded), with 95% of exposure, based on notional amounts (Held, 2019). Nearly two-thirds of interest rate swaps, forward rate agreements, interest rate options, and currency swaps have relied on LIBOR as a floating-rate benchmark (Garritt & Devlin, 2018). Other asset classes that are tied to LIBOR include floating-rate bonds and loans, along with asset-backed securities, mortgage-backed securities, and collateralized debt obligations.

B. Motivations for Change and Manipulation History

LIBOR came under scrutiny due to the manipulation scandals of the financial crisis years (2007–2009), when some panel banks gamed the system by misrepresenting their perceived borrowed rates. They were either trying to obtain illicit market gains or protect against credit risk. For example, some banks overstated their LIBOR estimates in order to produce better returns on their swap books, or in contrast, understated estimates to avoid signaling financial weakness. This manipulation was possible since the system allowed banks to estimate borrowing rates instead of report rates at which they actually borrowed. Submitted quotes were often hypothetical guesses and, hence, quite easy to compromise.

In 2014, the Financial Conduct Authority (FCA) began oversight of LIBOR-related regulation, but by this time, the industry had begun to lose confidence in LIBOR (Garritt & Devlin, 2018). As the number of unsecured, interbank borrowing deals had declined over the past decade, LIBOR rates grew more

dependent on the subjective estimates of the submitting panel banks, where “expert judgment” substituted for rates actually paid. Many of these banks were uncomfortable providing judgment on something they were now doing less often, which then led to the absence of an “active underlying market” (Garrit & Devlin, 2018). In other words, there is insufficient liquidity, especially in longer-term unsecured interbank deposits, for LIBOR to be considered robust. Now, not enough banks obtain funding via the traditional LIBOR/unsecured market, so LIBOR has become both too volatile and subject to further manipulation.

In July 2017, Andrew Bailey, chair of the FCA, announced that the 20 rate-submitting banks will stop contributing to LIBOR by the end of 2021. According to Bailey, “After 2021, users of USD LIBOR must take into account the risk that the rate may no longer be available (Cain et al., 2018),” and even if it is, the FCA may deem it to be no longer representative of the market and thus noncompliant with European rate regulation. If investors continue to rely on LIBOR after 2021, volatility and manipulation risk may rise further as the volume of transactions continues to wane. Even if a reformed LIBOR does exist post-2021, Bailey asserts that the best way to avoid LIBOR-related risk is to stop writing new business that references LIBOR (Cain et al., 2018).

Within the U.S. specifically, the ARRC, created in 2014 by the Federal Reserve, has led the transition away from LIBOR. Its goal was to identify viable alternatives to LIBOR and encourage, rather than mandate, their use. The ARRC is a public/private partnership with at least 10 working groups, which has been tasked with: 1) creating model fallback language for new transactions in cash products; 2) establishing regulatory, tax, and accounting obstacles to the transition; and 3) developing a term structure for alternative risk-free reference rates. The International Swaps and Derivatives Association (ISDA) is the corresponding body for derivatives products.

In the discussion that follows, we begin with an overview of alternative risk-free rate candidates, while also highlighting properties of acceptable benchmark rates, ultimately focusing on SOFR, while providing a comparison of the differences between LIBOR and SOFR. We next look at both the credit spread adjustment and term structure adjustment that narrows the gap between LIBOR and SOFR to make them more directly comparable. Next, we provide a detailed discussion of fallback language, both in terms of general principles and with respect to specific asset classes (both cash-based assets and financial derivatives). We then consider ramifications of rate transition for insurance companies, while highlighting the impact of this issue as discussed on the annual (10-K) financial statements of these insurers. We also examine oversight concerns of various regulatory bodies both within and outside the U.S., and any international coordination among these agencies. We then provide specific recommendations for insurers to address transition risks, along with a summary of key processes employed by large insurance companies, as inferred from interviews with several risk management executives. We also include a detailed exploration of whether interest rate swaps will continue to qualify as an effective hedge when LIBOR

ends. We conclude with recent updates for estimating LIBOR, the development of derivatives markets relating to SOFR, and work still to be done.

II. Potential Replacements for LIBOR

A. Alternative Risk-Free Rate Candidates

Any alternative risk-free rate candidate must be based firmly on transactions. The administration of these rates will be done by central banks, per the notion that key interest rate benchmarks are for the public good, and their integrity and sustainability are crucial to curb financial stability risk. In June 2017, the AARC used several evaluation criteria to choose among several candidate alternative risk-free rates. It ultimately selected SOFR over overnight indexed swap (OIS), U.S. Treasury bill (T-bill) and U.S. Treasury bond (T-bond) yields, and term unsecured lending. SOFR measures the cost of overnight borrowing via repo transactions that are collateralized with U.S. Treasury securities in the triparty repo market. Thus, SOFR is as secured as possible, with the U.S. Treasury being the deepest and most liquid money market in the world. SOFR will be more robust, and thus less subject to manipulation, than LIBOR because it will be based on actual market transactions totaling \$800 billion to \$1 trillion in daily activity (Garritt & Devlin, 2018; Held, 2019), a greater volume than any other Treasury repo rate. SOFR began being published on April 3, 2018, and has been published every day since then.

Originally, SOFR was just an overnight rate, with no offerings to match the other tenors that LIBOR reached. It was thought that it would take some time to develop markets for longer, forward-looking tenors, with the ultimate target date being EOY 2021 when LIBOR effectively ends. However, investors are now trading derivatives tied to SOFR, expanding the market for SOFR into future terms. Derivatives trading is important for SOFR's acceptance in the market because investors use derivatives to hedge against potential losses from interest rate shifts.

B. Properties of Acceptable Benchmark Rates

According to Schrimpf and Sushko (2019), the ideal benchmark rate would have to: 1) provide a robust and accurate representation of interest rates in money markets that is not susceptible to manipulation; 2) offer a reference rate for financial contracts that extends beyond the money market (i.e., that could be used for discounting and the pricing of both cash instruments and derivatives); and 3) serve as a benchmark for term lending and funding (i.e., to avoid "basis risk" between asset and liability exposures). Designing a new reference rate is challenging because it is tough to satisfy all three of these desirable characteristics

while also ensuring the new rate is both accepted by the market and employed in actual financial transactions.

As for LIBOR, although it does satisfy the second and third characteristics above, it fails to meet the first characteristic. More specifically, it was too easily subject to manipulation, being based on the non-binding quotes supplied by a small set of banks rather than on actual market transactions. In response to this problem, reference rate reform has focused on connecting the new benchmarks with actual transactions in the most liquid segments of money markets. Then, according to Schrimpf and Sushko (2019), the new rates need to incorporate some or all of the following components: 1) shorter tenor via overnight markets where volumes are larger than for longer (e.g., 3-month) tenors; 2) moving beyond interbank markets to other types of counterparties (e.g., insurance companies); and 3) relying on secured rather than unsecured transactions. As will be indicated in the next section, SOFR satisfies all three of these attributes. However, while SOFR satisfies the first and second desirable characteristics from the preceding paragraph, it may struggle with respect to the third characteristic (i.e., as a benchmark for term lending and funding), since SOFR is based on overnight rates rather than on term transaction. However, if a SOFR-based term structure is developed, this obstacle could be overcome.

C. A Comparison of LIBOR and SOFR Characteristics

The transition from LIBOR to SOFR will not be seamless, as there are a plethora of differences in their most basic characteristics. In other words, SOFR is not an economic equivalent to LIBOR. Below is a categorization for each type of difference:

- LIBOR has many different tenors, the most common of which are 1 day, 1 week, 1 month, 2 months, 3 months, 6 months, and 1 year; SOFR, by its very definition, is an overnight rate and thus only matches tenors for LIBOR at 1 day. Thus, LIBOR is forward-looking and has a term structure, whereas SOFR is backward-looking and has no immediate term structure.
- LIBOR is an unsecured bank lending rate and thus contains an element of credit risk; SOFR is a secured rate, in the sense that it is based on overnight loans collateralized by U.S. Treasuries, and is thereby considered to be basically risk-free (i.e., without credit risk). For this reason, SOFR will typically be at a lower rate level than LIBOR.
- LIBOR is published by the IBA and is based on both bank submissions and expert judgment; SOFR is published by the Federal Reserve Bank of New York and is based purely on market transactions. Thus, the market for SOFR is considered deeper and more robust and thus less subject to manipulation than is LIBOR, especially in recent years when the LIBOR market has thinned out.

- Because SOFR is tied to Treasury yields, it is considered to be more volatile than 1-day LIBOR since T-bill yields tend to fluctuate frequently, especially at month-end and quarter-end, as investors rebalance to supply and demand. However, 3-month-average SOFR-based rates are less volatile than 3-month LIBOR.

III. Adjustments Needed to Convert from LIBOR to SOFR

A. The Credit Spread Adjustment

ISDA is developing a credit spread methodology to help make the transfer from LIBOR to SOFR more tractable and the two rates more directly comparable. Recall that LIBOR is an unsecured rate and thus has an element of credit risk. In contrast, SOFR is virtually risk-free since its underlying repo transactions are secured by U.S. Treasuries. Thus, SOFR will generally be lower than LIBOR but not always lower by the same amount. Hence, compensation will be needed between counterparties who change reference rates for existing contracts from LIBOR to SOFR. This compensation could be a fixed or floating adjustment spread and/or a one-time payment from the favored party to the disfavored party at the time of transition.

Many feel that this credit spread should be fixed at the official announcement date for when LIBOR is discontinued. Others fear that such a spread could be higher than the previous spread borrowers were paying over LIBOR and potentially alienate customers. Any adjustments made must be fair, transparent, and easily understood, and they must minimize the extent of winners and losers so that all parties are treated equitably relative to their prior interest rate positions; in other words, there should be little to no value transfer at the point of transition. The adjustment should also be based on objective factors rather than on discretionary factors; this will help avoid the possibility of its level being subject to rate manipulation.

B. The Term Structure Adjustment

ISDA is also developing term-related adjustments since SOFR was originally conceived as a strictly overnight rate, but many LIBOR reference rates in use extend for longer tenors. In fact, the majority of contracts that reference LIBOR use 3-month, 6-month, or even 12-month terms (such as are used for mortgages). To create a forward-looking SOFR that extends past overnight for the length of a given term, one must develop yield curves from trading in forward-based SOFR derivatives markets. This is exactly what has transpired since the spring of 2018.

As of July 2019, with only 900 days left until EOY 2021, there was concern about the progress of the LIBOR/SOFR transition, mainly because of the lack of term rates for SOFR and its comparables in other nations (e.g., Sterling Overnight Index Average [SONIA] for the UK). The FCA's Bailey noted that derivatives markets had made more progress on the transition than had corporate bond markets or loan markets (Kolchin, 2019b). He warned that firms had significant legal risk for how to handle LIBOR-based legacy contracts if no arrangement was made for a replacement rate when LIBOR ends. He further warned firms not to wait for full-term structures to develop through futures and swaps markets before tackling the transition in their affected portfolios head on. The ARRC plans to have a fully developed term structure for SOFR by EOY 2021 when LIBOR is set to disappear.

IV. Fallback Provisions

A. General Principles

There are two urgent tasks that affected market participants must tackle. First, they must stop writing new contracts based on LIBOR, instead implementing SOFR. Second, for existing contracts that extend past 2021, the fallback language needs updating. ARRC guidelines, although voluntary, recommend a common approach in which market participants maintain consistency in fallback language across all asset classes (partly to minimize basis risk), use SOFR as the official replacement rate, minimize value transfer if a fallback is triggered, and include specific triggers that activate a fallback (Schell et al., 2018).

LIBOR-based products are still being created and sold, and other legacy LIBOR-based products also persist, both of which could endure past 2021, when the publication of LIBOR may cease altogether. The key issue is what will happen to such contracts when LIBOR is no longer available. Are there contractual fallbacks in place that are satisfactory to all parties if such fallbacks are later triggered? Contracts often contain fallback language in case LIBOR rates should become unavailable. However, many fallback rates are only appropriate for short-term disruptions to LIBOR and are thus not practical if LIBOR is permanently discontinued. In fact, the term "legacy fallback language" specifically refers to "language that does not explicitly contemplate the permanent unavailability of LIBOR (Schell et al., 2018)."

If existing fallbacks fail to produce an alternative rate, or if existing parties fail to agree on an alternative rate, contracts could either be terminated or end up in litigation. Important in such situations is whether bilateral consent is required to change reference rates or if only unilateral consent is needed. Recent amendments to fallback language have typically insisted on bilateral consent for changes in rate structure since unilateral changes will favor one side over the other. Note that for many long-term derivatives contracts, some with terms extending at least 20 years

further into the future, there are no fallback provisions. Thus, there is catastrophic litigation risk exposure for these contracts since \$200 trillion or more in notional amounts are at stake (Held, 2019; Kolchin, 2019b).

The U.S. Securities and Exchange Commission (SEC) has advised companies to actively manage risk and anticipate any exposures relating to LIBOR transition. This includes a general review of both existing and new contracts, and a determination of whether the contracts, either individually or in aggregate, may create a material risk to the company's operations. Companies should also keep investors informed about efforts to identify exposure to LIBOR cessation. This process will go more smoothly if there is consistency and agreement across the industry and if the new fallback language (and rates employed) is simple and standardized. Remember that the goal is to ensure that all parties are in the same economic position once the new fallback language is triggered, as they were before the transition.

Another unattractive alternative is that many legacy contracts could revert to a fixed rate, the level of which is set at the last available floating rate when LIBOR ends. This rate would persist for the remaining term of the contract, even if the contract was originally intended to be based on floating, market-based rates. Alternatively, interest rates for the borrower could increase substantially at the time of transition, moving them from a favorable or neutral position to a highly unfavorable one.

B. Fallback Provisions for Specific Asset Classes

To date, the ARRC has already finalized language for cash products like floating rate notes, business loans, securitizations, and adjustable-rate mortgages. Its original focus was on identifying alternatives to LIBOR and encouraging voluntary adoption, rather than mandating a transition away from LIBOR. Meanwhile, ISDA is working on fallback language for derivative-based contracts.

Floating-rate notes and mortgage-backed securities remain vulnerable, as many have no fallback language or are contractually converting to a fixed rate structure that will no longer protect its users from interest rate risk. For securities issued in the capital markets that reference LIBOR, the legacy fallback language is that, upon LIBOR ending, the reference rate be set at the last LIBOR level for the immediately preceding interest reset period. This language was initially established to address the temporary unavailability of LIBOR and is not suitable on a permanent basis since it would convert floating-rate securities to fixed-rate securities, where the fixed rate is established at the exact time of the transition rather than being tied to market rates. This could create winners and losers (Schrimpf & Sushko, 2019; Schell et.al., 2018) without bilateral consent of all parties since any amendments to legacy contracts caused by unilateral changes could favor one party (with respect to interest rate exposure) at the expense of the other. Corporate bond markets may be the most difficult to convert since consent is required among all contractual parties to complete the transition.

For derivatives contracts, specifically USD-denominated swaps, ISDA recommends that all affected parties confirm further amendments. More specifically, it recommends a fallback to an alternative rate and the incorporation of a spread to compensate for the difference. In forming this spread, it seeks to minimize any potential for manipulation and avoid any distortion from market stress at the exact time the fallback is applied. Overall transitioning will go much more smoothly if derivative counterparties in general adopt the ISDA-recommended protocol, rather than negotiating on a seriatim contract basis. For derivatives contracts, most of which are interest rate swaps based on master agreements, ISDA is still working on standard protocol to amend existing transactions, but any adoption of this by derivatives counterparties would be strictly voluntary. For these reasons, there may potentially be a divergence between trigger events in cash and derivatives products. This is problematic since a borrower has “basis risk,” with one reference rate for its loans but a separate, unmatched reference rate for its interest rate hedges.

V. Ramifications of Rate Transition for Insurance Companies

A. General Impact on Financial Institutions

According to the Federal Reserve, “Greater reliance on alternative reference interest rates will make financial markets more robust and thus enhance the safety and soundness of individual institutions, make financial markets more resilient, and support financial stability in the United States (Garret & Devlin, 2018).” These institutions include both commercial banks and insurance companies. Firms and institutions need to update their models and systems to implement the LIBOR/SOFR transition, which includes helping their clients accept the change. Below is a discussion of rate transition issues, as pertains specifically to insurance companies. Insurance companies have transition risk on both sides of their balance sheet, as the valuation of both assets and liabilities may be impacted.

B. Insurer Assets Affected by Rate Transition

With respect to specific life insurance assets, asset valuation will be impacted when the discount rate used is directly or indirectly tied to LIBOR. Examples include cash products like bonds and loans, derivatives like interest rate swaps, floating rate notes, and securitized products like collateralized debt obligations. For life insurers, LIBOR most often appears in derivatives contracts, specifically interest rate swaps, which are used almost exclusively for hedging purposes when the corresponding liabilities are long-term.

Also, insurers that issue floating rate debt, or debt securities with floating rate provisions, will also be affected if LIBOR is no longer available as a reference rate. Over the last 10 years, with interest rates being so low, there has been an increase in adjustable-rate products, as some asset managers hope to capitalize on interest rate levels eventually going up. Insurance sector exposures are higher in the five jurisdictions with LIBOR currencies (USD, GBP, EUR, CHF, and JPY) than in non-LIBOR currency jurisdictions. However, in Europe, the majority of the exposure is concentrated in the UK.

In the U.S., the NAIC's Capital Markets Bureau soon (i.e., later in 2021) plans to release a report on the full extent of industry exposure to LIBOR among U.S.-based insurers. In 2020, though, the NAIC did release some more high-level data on the percentage of assets (based on book/adjusted carrying value [BACV]) in each major asset class for U.S. life insurers (Wong & Kaminski, 2020). This data is summarized in Table 1 below, where asset classes potentially linked to LIBOR are highlighted in bold. Included within the category of bonds in Table 1, which constitutes 70.14% of total U.S. life insurance cash and invested assets, are both (LIBOR-linked) floating rate securities and collateralized loan obligations (CLOs). While the report did not offer a fixed v. floating rate breakdown for bonds, the total amount of CLOs at EOY 2019 was \$125,794 million, or about 2.75% of all life insurance assets (Johnson & Carelus, 2020). Other applicable, LIBOR-linked bond subcategories (in millions of USD, with % of Total) include asset-backed securities (ABS): 316,535 (6.91%); agency-backed residential mortgage-backed securities (MBS): 172,018 (3.75%); private-label commercial MBS: 143,217 (3.13%); private-label residential MBS: 74,951 (1.64%); and agency-backed commercial MBS: 53,773 (1.17%).

To demonstrate the significance of rate transition on the insurance industry from a more qualitative basis, we examined the annual (10-K) financial statements for several of the largest U.S. life insurance companies (all ranked in the top 20 by assets). This issue was repeatedly mentioned as one of the primary "risk factors" that each company was managing and noteworthy enough to summarize the recent relevant progress made in respective annual reports to shareholders. Here are some common themes that emerged from these financial statements, all found in the "Risk Factors" sections:

- Estimates for both cost of capital and net investment income are impacted. More specifically, asset classes affected (i.e., directly or indirectly tied to LIBOR) include floating-rate securities, derivatives (especially interest rate swaps), loans and third-party loans, and real estate lending activities. The floating-rate bonds/notes could either be insurer investments (assets) or insurer issues (liabilities).
- Valuation, pricing, and profitability models are at risk for any products that incorporate LIBOR and require adjustments to manage the rate transition.

- Additional liquidity and trading risks are present, as rate changes affect both the market liquidity and market value of any investments tied to LIBOR.
- Additional interest rate risks are present, especially with respect to hedging and basis risk, since rate levels may experience a discontinuity amid the transition.
- Additional operations risks are present, as companies must devote extra resources to managing the transition while communicating associated risks to various constituents. For example, companies must expect additional inquiries from regulators about their preparations for the transition while demonstrating their readiness to both regulators and shareholders (via financial statements).

Table 1: Total U.S. Life Insurance Cash and Invested Assets by Asset Class, Year-End 2019

Asset Class	Assets (in millions of USD)	% of Total
Bonds	3,213,563	70.14%
Mortgages	578,642	12.63%
Schedule BA (Other Long-Term Assets)	214,996	4.69%
Common Stock	179,092	3.91%
Contract Loans	134,059	2.93%
Cash & Short-Term Investments	123,443	2.69%
Derivatives	79,672	1.74%
Real Estate	23,361	0.51%
Securities Lending (Reinvested Collateral)	16,157	0.35%
Preferred Stock	13,701	0.30%
Other Receivables	5,094	0.11%
TOTAL	4,581,780	100.00%

C. Insurer Liabilities Affected by Rate Transition

The transition affects insurers due to impacts on their business, investments, customers, and counterparties. The transition is expected to affect life insurance companies to a greater degree than property/casualty (P/C) or health insurers, as life insurers are much more likely to have long-term liabilities. Furthermore, even if P/C and health insurers do have some longer-term liabilities, they are not typically as interest-sensitive. Furthermore, SOFR is based on the cost of overnight loans, or repurchase agreements, and many insurers use these “repos” to borrow cash overnight using U.S. government debt as collateral. A large number

of debt agreements, lease agreements, and derivative positions will need to be modified as a result of rate transition, which creates a plethora of legal, logistical, and operational challenges. Insurance company liabilities, in particular interest-sensitive annuity products, may also be tied directly to LIBOR. Insurers who issue such annuities or any other embedded options with guaranteed rates tied to LIBOR may need to update their policy forms. Also, the benchmark rate used to determine life and annuity reserves, for valuation purposes, may need to be revised.

One additional source of exposure for insurers is vendor contracts with third-party administrators (TPAs). There may be thousands of these contracts throughout the enterprise, many of which have very unique terms. The risk is that the borrower will exploit any reference rate change to renegotiate their terms, and if such terms are not favorable enough to them, they may in some cases terminate the contract. Perhaps an amendment can be made to these contracts that allows changes to the reference rate in some common fashion without necessarily allowing the borrower to change other terms of the contract in the process.

D. Transition Risks in Forming Annual Reports, and In Both the Valuation and Modeling of Assets and Liabilities

Many insurance companies have already begun disclosing transition risk in their annual reports, now that the EOY 2021 deadline for LIBOR's existence has been mostly accepted. On the balance sheet, insurers need to account for all LIBOR exposures, not just in hedge-related assets and liabilities, but in "other assets and liabilities," such as reinsurance arrangements. Variable rate loans or bonds will also be affected, especially if their valuation is sensitive to discount rates. Insurance companies must also worry about basis risk since the discount rates used to value liabilities may no longer be in sync with the discount rates used to value the hedges backing the liabilities. Insurers can expect significant price fluctuation on the derivatives used to hedge liabilities as the LIBOR/SOFR conversion plays out. The ability of insurers to establish appropriate fallback provisions is key in minimizing these risks. Asset and liability models that contain certain parameters that are tied to reference interest rates will have to be adjusted. Such systems and models will require updating, similar to the work done back during the Y2K transition. At the modeling level, some scenario testing will be key in assessing potential risk levels.

A survey of 22 members of the International Association of Insurance Supervisors (IAIS) indicated that on a global scale, insurers' exposures to LIBOR are concentrated in certain insurance companies, depending on geographic location, balance sheet structure, business model, products, and size. On the liability side, exposure was more limited when compared with the asset side, except for insurers in the UK, due to their reliance on the European Insurance and Occupational Pensions Authority (EIOPA) pound sterling risk-free risk curve, which is based on LIBOR.

VI. Regulatory Concerns in Oversight of Transition Risk

A. U.S.: NAIC and State Insurance Commissioners

In the U.S., the majority of work conducted by supervisors is through informal inquiry rather than on-site exams, the extent of which will depend on each state's degree of preparedness. For insurers with relatively heavier LIBOR-related exposures, some states may conduct on-site examinations. According to an NAIC Capital Markets Special Report from March 2020 (Wong, 2020), the NAIC will continue to work with the insurance industry to develop appropriate transition language. More specifically, the NAIC will work with state insurance regulators to address all key issues arising from the transition. The NAIC's Financial Stability (E) Task Force will coordinate and oversee this work, while the Life Actuarial (A) Task Force will address issues relating to policy forms and life-annuity reserves. Finally, the Valuation of Securities (E) Task Force will cover issues relating to investments, derivatives, and basis swaps (Wong, 2020). Note that as SOFR is less volatile than LIBOR, the transition is expected to lead to an aggregate reduction in risk.

When the NAIC determines LIBOR is no longer effective, it will recommend a replacement rate to the Life Actuarial (A) Task Force, which shall be effective upon adoption by Task Force (NAIC, 2020b). When LIBOR ceases to exist, the requirements of the *Valuation Manual* will need to change, so that an alternative rate (SOFR) will replace LIBOR in the calculation of interest rate swap spreads over Treasuries (NAIC, 2020b). These swap spreads are needed for transactions relating to the purchase, sale, and settlement of derivative positions, or the reset of floating rate investments. Note that these swap spreads were formerly based on the average of submitted values from banks like J.P. Morgan and Bank of America. Going forward, however, they will be based on market observable values for 3-month and 6-month tenors, with a long-term swap spread curve prescribed for longer tenors.

B. Global: Insurance Supervisors and the Questions They Ask

Around the world, although most insurance supervisors have not set official deadlines for insurers to transition away from LIBOR, many authorities in LIBOR currency jurisdictions have taken several initiatives to facilitate the transition. For any global jurisdictions for which insurance supervisors have acknowledged a material transition risk in their markets, the supervisors are now engaging with individual insurance companies by sending industry-wide communications and possibly requesting particular information from companies most affected. In some cases, they have encouraged the formation of national inter-company working groups. These requests include sending letters to insurer CEOs, asking insurers to

set their own internal targets and deadlines, and in some cases, carrying out either desktop reviews or on-site examinations. These exams would happen mostly for the largest insurers, and they would focus on identifying LIBOR-related exposures and assessing the readiness for adapting to alternative benchmark rates. If necessary, supervisors will carry out additional reviews or on-site examinations, checking for types and levels of LIBOR exposure, transition plans in place, governance over transition work, and the progress of negotiation with any counterparties.

With respect to the identification of LIBOR exposures, insurance supervisors use a risk-based approach, with more attention allocated to insurers in high-risk areas (based on geographic location, balance sheet structure, and size). The supervisors will write both public statements and follow-up letters to CEOs to promote awareness of transition issues and associated risks. In many jurisdictions, further efforts are needed to raise awareness among smaller insurers. In response, the risk management personnel at insurance companies would identify all LIBOR-referenced contracts, specific areas of risk concentration, and action plans for transitioning to alternative benchmarks, including a listing of senior management responsible for implementation.

As to facilitating the transition, insurance supervisors must clearly communicate to insurers the timing of the change and the need for insurers to have systems in place to satisfy this deadline. Supervisors may also need to provide regulatory guidance on legacy contracts that are difficult to convert due to the lack of robust fallback language, while recommending standard language if possible to avoid individual renegotiations.

The results of a Financial Stability Board (FSB)- Basel Committee on Banking Supervision (BCBS) questionnaire indicate significant gaps in quantifying LIBOR exposures and adopting fallback language among global insurers. These deficiencies make it difficult to quantify the full degree of financial stability risk relating to the LIBOR transition. Thus, insurance supervisors may need to redouble their efforts to promote awareness of transition-related issues. As for next steps, the FSB, in collaboration with the IAIS, will design a set of key metrics and indicators to measure LIBOR exposures and transition status, along with a list of qualitative questions to help monitor progress made. It is expected that these new assessment measures will be ready in 2021.

C. Internal Coordination of Global Regulators During the COVID-19 Pandemic

Note that both the IAIS survey and the FSB-BCBS survey were undertaken before the onset of the COVID-19 pandemic, and thus ignore the effects of the pandemic on financial stability. However, the FSB has since noted that LIBOR rate transition remains just as essential now versus before the pandemic started in terms of maintaining and strengthening the global financial system. In fact, the pandemic has further highlighted that the markets LIBOR has previously sought to

measure are no longer sufficiently active. It is likely that transition plans at some insurers have been de-prioritized since the pandemic started, and this is unfortunate since the compressed time period for when rate transition needs to take place (i.e., still EOY 2021) is not being delayed.

Thus, insurance supervisors may need to strengthen their efforts to raise awareness about transition issues, especially if there are cross-border implications that require coordination and monitoring at an international level. Insurance supervisors can jointly promote coordination efforts on rate transition by sharing latest developments and best practices. Some insurance supervisors are concerned about inconsistencies with how benchmark reform is being implemented domestically among states (in the U.S.) or across international markets, both in terms of timing and methodology. For example, the varied nature of the alternative reference rates selected can make risk management and hedging activities challenging. Are the new rates collateralized or uncollateralized? Are the new rates in various jurisdictions all going into effect at the same time? These issues are particularly important for multi-currency products like cross-currency swaps and balance sheet hedges.

VII. Recommendations to Insurers Regarding Rate Transition

For global benchmark reform to be successful, there must be broad market adoption of the various alternative risk-free rates, which is no small task given the proliferation of asset classes and financial instruments affected. Going forward, global efforts will work best if transition plans are consistent and coordinated, and if interest rate benchmarks are robust and appropriately used by all market participants. Within each company, enterprise risk management should capture any firm-specific vulnerabilities if LIBOR ceases to be published. Once those risks are identified, they can be more tangibly valued on the balance sheet. Right now, the larger insurance companies are taking much stronger actions to transition away from LIBOR than are smaller insurers. This may be because larger insurers are more likely to have significant exposure to LIBOR, but this may also be because they are more able to allocate sufficient risk management resources to addressing transition issues head-on. These larger insurers typically document their internal processes, establish project teams to manage the transition, keep executives updated on progress made, and establish legal teams to review all of their contractual obligations. In general, the large-insurer risk officers seem confident that both the industry and their own companies are on track to manage the transition before LIBOR expires in late 2021. More specifically, transition plans might include improving awareness and providing guidance to market participants, monitoring progress via surveys and information requests, outlining responsibilities and expectations, and coordinating working groups both internally and externally.

Transition risks may arise from operational, legal, conduct, hedging, and accounting perspectives. Transition challenges include the need to further develop cash products that are not linked to LIBOR; concerns about the lack of liquidity, data, or term structure with respect to alternative reference rates; the adoption of fallback language; and the willingness of clients to make adjustments. The lack of standardized fallback provisions may necessitate a costly and time-consuming process by which contracts are individually renegotiated. This will result in a heavy legal workload and could lead to higher lapse rates for contracts of counterparties who do not wish to amend original contracts. Renegotiation could lead to conduct risk, whereby a potential transfer of value occurs, such that the disadvantaged party could take legal action. There could also be increased market risk—specifically basis risk—if the loans and derivatives used to hedge them adopt different approaches for reference rates, or if insurers use a different valuation rate for the assets on their balance sheets than they do to value liabilities.

As for specific sources of risk exposure, the primary category is any documents or contracts that quote LIBOR as a reference rate, and any associated fallback language (or the lack thereof) for dealing with a potential break or discontinuance of LIBOR. A full inventory of exposures should be conducted at the enterprise level, with two separate buckets for analysis: 1) those contracts expiring before or during 2021; and 2) those contracts expiring after 2021. A major concern is the possibility of a systems-related glitch when the rate transition actually takes place, similar to what companies were fretting about during the months leading up to the Y2K issues of 1999–2000. More specifically, with adequate planning, there is a low likelihood of any significant disruptions, but if these disruptions do occur, there could be major litigation risk from contract counterparties. Furthermore, even after the rate conversion takes place in 2021, there may still be an extra 2- to 4-year window for transition risk that requires frequent monitoring.

As for the credit spread and term structure adjustments, the term structure adjustment is of greater concern, for if this was not ready by the time of the rate transition, the ramifications could be dire. However, progress had been made in this area by “quant-minded” experts over time via the development of the futures market for various terms on the yield curve. An easy approximate solution for the credit spread, when transitioning from LIBOR to SOFR, is to use SOFR plus some fixed spread, perhaps on the order of 25 basis points. There may also be more complex approaches employed in certain cases, the goal being to maintain equity among all contractual parties. The credit spread adjustment will be harder to implement than the term structure adjustment. However, with the credit spread being so small, the consequences of getting this wrong are not as severe.

VIII. Are the Interest Rate Swaps Held by U.S. Insurers Still Considered to Be Effective Hedging Instruments?

For derivative contracts that are cleared through an exchange, the transition will result in a basis swap to account for the difference between how LIBOR and SOFR are calculated. The primary issue is that it is potentially unclear as to whether this basis swap will qualify as one of the three allowed uses of derivatives: 1) hedging; 2) replication; or 3) income generation. *Statement of Statutory Accounting Principles (SSAP) No. 86—Derivatives* states that derivatives used for these three purposes are “admitted.” otherwise, the derivatives are classified as “other derivatives” and are deemed “nonadmitted.”

The NAIC’s Financial Condition (E) Committee met in June 2020 to discuss a proposal from the American Council of Life Insurers (ACLI). This proposal requested two things: 1) a safe harbor to address state laws that limit the types of derivatives insurers can engage in; and 2) to deem derivatives relating to rate transition as effective hedges. Basically, under the LIBOR transition, insurers will be receiving certain swaps that do not easily fit into one of the three allowable categories for derivatives. Thus, unless companies receive a clarification issued by state insurance commissioners that allow these as permissible investments, they would be forced to sell these basis swaps the day they were received (and potentially incur investment losses for their policyholders). In other words, if insurance companies have to unwind their swaps early, this could be potentially disadvantageous.

The Financial Accounting Standards Board (FASB) also issued *Accounting Standards Update (ASU) 2020-04, Reference Rate Reform (Topic 848)* to ensure that financial reporting results would continue to reflect the intended continuation of contracts and hedging relationships during the period of rate transition. Thus, remeasurement or dedesignation would not be required if certain criteria were met. From an accounting perspective, any contract modifications typically require a determination about whether changes result in the establishment of a new contract or the continuation of an existing one. A change to any critical terms, including reference rate modifications, would typically require remeasurement of the contract, or in the case of a hedge, a dedesignation of the transaction.

Per ASU 2020-04, a modification due solely to reference rate reform would not be considered an event requiring remeasurement since reference rate changes are a market-wide initiative and are outside the control of the insurer. Thus, the FASB decided that the traditional financial reporting requirement of discontinuing such contracts (or hedges) and treating the modified contract (or hedge) as a new one would not provide useful information to financial statement users. Furthermore, it would result in significant additional costs in both the preparation of financial statements and due to potential adverse impacts on financial statements. Note that ASU 2020-04 only applies from March 12, 2020, to

December 31, 2022, (the period for which rate transition is expected to occur) for contracts that have previously referenced LIBOR as a reference rate. Thus, its scope does not include other contract modifications (besides rate transition) that occur during the ordinary course of business. Also note that NAIC staff support the adoption of ASU 2020-04 as issued by the FASB.

This issue is also addressed in Interpretation (INT) 20-09T, an interpretation of the NAIC's Statutory Accounting Principles (E) Working Group, along with SSAP No. 86. Basis swaps are defined as compulsory derivatives issued by central clearing parties (CCPs), solely in response to the transition from LIBOR to SOFR. The clearinghouses made a one-time move to change their valuation from LIBOR-based to SOFR-based on Oct. 16, 2020. This process involved a cash adjustment to each account to offset any value gained/lost as a result of the rate transition. It also included a mandatory basis swap that restores the account's original risk profile. This occurred in October 2020 instead of December 2021 in order to create additional liquidity in developing a SOFR-based term structure in advance of the changeover date. Previously, the Working Group had adopted INT 20-01, which allows for contract modifications due to reference rate reform, to be accounted for as a continuation of the existing contract without requiring remeasurement or dedesignation when the reference rates change.

From an accounting perspective, there are two big issues: 1) How should basis swaps be classified and reported in the statutory financial statements? 2) How should basis swaps be valued in the statutory financial statements? With respect to the first issue, the Working Group reached a consensus that any basis swaps relating to reference rate reform shall be classified as a derivative used for hedging (i.e., one of the three allowed uses) and thus will be deemed "admitted" under SSAP No. 86. As for the second issue, the Working Group reached a consensus that any basis swaps relating to reference rate reform shall not be considered as an "effective hedging derivative" (using the hedge accounting measurement approach from SSAP No. 86) unless it can be documented to be a "highly effective hedge." For example, if the insurer has a financial instrument on which it is currently receiving income based on a variable rate, but wishes to receive income based on a fixed rate, it will enter into an interest rate swap. If this transaction qualifies as an effective hedge and the financial instrument is valued and reported at amortized cost, then the swap would also be valued and reported at amortized cost, on a statutory basis. If the basis swap is not an effective hedge, it shall be accounted for at fair value so that changes in fair value will be recorded as unrealized gains or losses.

IX. Conclusion: Recent Developments / Work Still to Be Done

The following discussion highlights the latest methodology utilized by the IBA to estimate LIBOR and the most important work remaining to be completed

before the official LIBOR/SOFR rate transition takes place. We also provide an overview of the development of derivatives markets linked to SOFR from 2018 to the present time.

With the majority of the risk exposures to the transition already identified by the end of 2020, the current year (2021) will be critical for further SOFR rate development. When constructing new products, it is better to start with a simpler version of SOFR rather than continue to rely on LIBOR until a full SOFR-based term structure is ready. The first building block would be overnight SOFR, as developed by the Federal Reserve Bank of New York. By 2020, this was extended to an “average SOFR,” where the average is either an arithmetic one or compounded across the period of interest. Ultimately, the final building block will be a forward-looking term SOFR, based on rates generated over time by the liquidity that SOFR-based derivatives markets provide. It is imperative that the methodology used to calculate term SOFR be transparent and understandable.

The LIBOR-SOFR transition gained momentum when derivatives trading kicked off in 2018. SOFR futures began to be traded on May 7, 2018, with both 1-month and 3-month contracts offered. By late 2018, there were already more daily transactions relating to SOFR futures than there were LIBOR futures. By July 2018, SOFR-based interest rate swaps were introduced to the market, with SOFR-based floating rate notes soon issued thereafter. As of June 2019, 27 institutions had issued more than \$136 billion notional in floating rate securities tied to SOFR (Kolchin, 2019a). In fact, from May 2018 to April 2019, the total market for SOFR-linked products, both cash and derivatives-based, increased from less than \$100 billion notional to more than \$9 trillion (Kolchin, 2019a). The growth trajectory of this SOFR market is greatly accelerated relative to similarly new peer products historically, mostly due to LIBOR’s shelf life being limited, or even terminal. By mid-2019, the mix of market participants trading in SOFR futures included investment banks, asset managers, hedge funds, and trading firms.

These trends need to continue to provide the SOFR market with the necessary liquidity that will enable the formation of a forward-looking term structure. This is necessary for the rate conversion since SOFR was originally an overnight rate, but LIBOR extended to longer tenors. In 2021, it is likely that longer-term SOFR rates will be available to fill the void that LIBOR leaves behind. This had better be the case, however, as the lack of a SOFR-based term structure in the U.S. (or a SONIA-based one in the UK, e.g.) would make the final transition quite chaotic.

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