



Article of the month:

Human-computer Interaction: The actuary's next behavioral science toolkit

David Simmons. (*The Actuary Magazine*)

"64 6f 20 79 6f 75 20 75 6e 64 65 72 73 74 61 6e 64 3f." Do you understand? Unless you are a computer with a hexadecimal translator, this series of alphanumeric characters should not mean much to you. However absurd this question may seem, there was a point in time when programmers had to create coding at this level of interaction with machines. In this article, we will explore how human-computer interaction (HCI) will and has transformed our industry through both the tools we use and the ways we communicate. We will utilize the studies of HCI and reference impacts of behavioral economics (BE) on our industry to demonstrate how these lessons influence our work. [Read More](#)

Atuarial Models

Machine-Learning Methods for Insurance Application

Alex Diana, Jim E. Griffin, Jaideep Oberoi, Ji Yao. (SOA)

In this report, we describe and illustrate a range of machine-learning approaches that have been used in the insurance literature or have the potential to be used. We emphasize variable selection methods, including those applicable to the generalized linear model (GLM), the current workhorse for the industry. The methods covered include LASSO, elastic net, ridge regression and Bayesian variable selection. The former three methods involve penalizing the objective function as a means of shrinking certain parameter estimates toward zero. The latter approach assigns weights to alternative models in order to combine them to select features that have predictive value. [Read More](#)

Yield curve shapes of Vasicek interest rate models, measure transformations and an application for the simulation of pension products

Franziska Diez, Ralf Korn. (*European Actuarial Journal*)

We consider two aspects of Vasicek interest rate models arising from chance-risk classification of German pension products. First, we show that the two-factor Vasicek model can explain significantly more effects that are observed at the market than its one-factor variant. Among them are humped shapes independent of the interest rate level and the occurrence of dipped yield curves. We further introduce a general change of measure framework for the Monte Carlo simulation of the Vasicek model under a subjective measure. In chance-risk classification it can then be used to avoid the occurrence of a far too high frequency of inverse yield curves with growing time. [Read More](#)

Bias regularization in neural network models for general insurance pricing

Mario V. Wüthrich. (*European Actuarial Journal*)

Generalized linear models have the important property of providing unbiased estimates on a portfolio level. This implies that generalized linear models manage to provide accurate prices on a portfolio level. On the other hand, neural networks may provide very accurate prices on an individual policy level, but state-of-the-art use of neural networks does not pay any attention to unbiasedness on the portfolio level. This is an implicit consequence of applying early stopping rules in gradient descent methods for model fitting. In the present paper we discuss this deficiency and we provide two different techniques to overcome this drawback of neural network model fitting. [Read More](#)

Financial Risk

Hemp: A Puzzle for Farmers and Actuaries Alike

Rebecca Armon. (*CASACT*)

The 2018 Farm Bill legalized hemp, but what does that mean for farmers and how will actuaries play a role in developing crop insurance for it? Marijuana has been in the news lately as multiple states have legalized it even though the Drug Enforcement Administration still lists it as a Schedule I drug. Hemp is another product of the cannabis plant that is getting some legal support at the federal level. The 2018 Farm Bill defined hemp as “the plant *Cannabis sativa* L. and any part of that plant, including the seeds thereof and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, whether growing or not” and specifies the limitation “with a delta-9 tetrahydrocannabinol (THC) concentration of not more than 0.3 percent on a dry weight basis.”

The limit exists because THC is the part of the cannabis plant that makes people high. The Agricultural Act of 2014 allowed industrial hemp cultivation under state-controlled pilot programs, but the 2018 Farm Bill put in regulations to expand farming hemp. The 2018 bill requires states and tribal governments to develop a plan to monitor the amount of THC in the plants and dispose of any that exceed the 0.3% level. [Read More](#)

It's the Tail-Risk, Stupid!

Matthias Thiemann, Tobias H. Troeger. (*SSRN*)

The use of contractual engineering to create channels of credit intermediation outside of the realm of banking regulation has been a recurring activity in Western financial systems over the last 50 years. After the financial crisis of 2007 and 2008, this phenomenon, at that time commonly referred to as ‘shadow banking’, evoked a large-scale regulatory backlash, including several specific regulatory constraints being placed on non-bank financial institutions (NBFIs). This paper proposes a different avenue for regulators to keep regulatory arbitrage under control and preserve sufficient space for efficient financial innovation. Rather than engaging in the proverbial race between hare and hedgehog that is emerging with increasingly specific regulation of particular contractual arrangements, this paper argues for a normative approach to supervision. We outline this approach in detail by showing that regulators should primarily analyse the allocation of tail risk inherent in the respective contractual arrangements. Our paper proposes to assign regulatory burdens equivalent to prudential banking regulation, in case these arrangements become only viable through indirect or direct access to an (ad hoc) public backstop. In order to make the pivotal assessment, regulators will need information about recent contractual

innovations and their risk-allocating characteristics. According to the scholarship on regulatory networks serving as communities of interpretation, we suggest in particular how regulators should structure their relationships with semi-public gatekeepers such as lawyers, auditors and consultants to keep abreast of the real-world implications of evolving transactional structures. This paper then uses the rise of credit funds as non-bank entities economically engaged in credit intermediation to apply this normative framework, pointing to recent contractual innovations that call for more regulatory scrutiny in a multipolar regulatory dialogue. [Read More](#)

How Changing Economic Conditions Over Multiple Periods Affect Earnings Overstatements, Audit Risk, and Market Prices

Evelyn Patterson, Reed Smith, Samuel L. Tiras. (SSRN)

We analyze a setting in which the auditor designs an audit to detect a possible overstatement in reported earnings over multiple periods. The multi-period analysis allows us to examine how changing economic conditions affect the auditor's assessment of fraud, the manager's inclination to overstate earnings, the firm's market price and audit risk. Good economic conditions may promote earnings overstatement due to the market's expectations for good earnings reports and may provide "cover" for a dishonest manager to execute a fraudulent reporting strategy. Alternatively, bad economic conditions may encourage earnings overstatement. The empirical implications of our study include: how bias is reflected in market prices through an intercept effect; the limitations of a contemporaneous research design on assessing the implications of an exogenous shock to existing economic conditions; and, how the changing expectations of future earnings affect the related implications of this choice on earnings overstatements, market price, and audit risk. [Read More](#)

Investments

A Note on Markowitz Model

Javier Vidal-García. (SSRN)

The Markowitz's model can be very useful in practice. Portfolio managers and private investors can use it easily having the necessary software for its correct application. In our study we show that the Markowitz model is able to provide portfolios that beat reference market portfolios (FTSE 100 and FTSE All-Share Index), obtaining higher returns with a lower risk. Both the FTSE 100 and the FTSE All-Share Index are not efficient portfolios, not reflecting the behaviour of the theoretical market portfolio. Therefore, the Markowitz model, as a tool for investment selection, provides portfolios with better performance than market benchmarks. [Read More](#)

Banking

Libor transition and implementation – Special report 2019

Risk.net

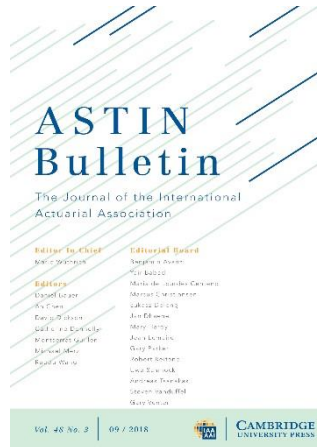
A critical halfway stage has been reached on the Libor transition journey – at least in terms of timing. It's just over two years since the UK's top financial regulator called notice on the discredited benchmark. It's also just over two years until the rate could cease to exist. When it comes to action, however, it's not clear whether this halfway point is even in sight given a to-do list that never seems to stop growing. Much has happened since mid-2017, when the UK's Financial Conduct Authority (FCA) chair, Andrew Bailey, made life without Libor a reality by freeing panel banks from the shackles of Libor quote submission after 2021. Most crucially, perception has gradually shifted. Denial has been replaced by widespread acceptance that Libor's days are numbered, accelerating efforts to embed regulator-preferred successor rates throughout the system. There's no magic fix, but some turbo-charged remedies look promising. For example, machine learning and natural language processing have already proved their worth in sifting through financial contracts and picking out those that may require the most immediate attention. It might take more than advances in artificial intelligence to smooth the transition from Libor. The derivatives and cash markets have work ahead before they can confidently dispose of the ubiquitous Libor benchmark. [Read More](#)

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