Truth matters. It matters because we rely on facts for making important decisions, both in finance and our everyday lives. Without truth, the only thing standing between us and bad decisions is dumb luck.

Too many dictionary definitions of "truth" are disappointingly circular. The one in the online McMillan Dictionary is an exception. It reads as follows: "the actual facts or information about something, rather than what people think, expect, or make up" (McMillan Education Limited n.d.). That is a very nice definition. It covers three essential points. The first is that truth is about what actually is. The second is that truth does not depend on what people want or believe. The third is that truth is not altered by lies.

America's handling of the Coronavirus pandemic has illustrated some key points about the truth. The first is that, without knowing the truth about the virus, it was impossible to make reliable predictions about how it would spread, how many Americans would be infected, and how many would die. For example, around mid-March, *The New York Times* reported on Harvard University models that anticipated scenarios where the number of seriously ill patients would vastly over-whelm hospitals and their intensive care units (Sanger-Katz, Kliff, and Parlapiano 2020). Nothing so severe actually materialized. The likely explanation for the discrepancy is insufficient or incorrect data rather than a lack of modeling skill by the experts at Harvard. The data did not deliver truth.

The New York Times was pretty quick to spot the issue. About a month later, on April 22, the newspaper ran a story titled "What 5 Coronavirus Models Say the Next Month Will Look Like" (Bui et al. 2020b). Of course, that article highlighted the fact that the different models produced different predictions. However, it also emphasized that many specifics about the virus remained unknown—there was no truth upon which to build the models. The article stated:

> However good the modelers' mathematical strategies may be, many of the descriptive facts about the virus are still unclear. Researchers aren't sure about the rate at which people who become infected die, or about the rate of transmission to other people. They don't know for sure how many people have already been infected and have some immunity to the disease—or how long that immunity will last. Even the count of coronavirus deaths itself is uncertain.

Several weeks later *The New York Times* again addressed the theme of agreement and disagreement among epidemiological models

(Bui 2020a). According to the article, greater consensus among the competing models was partly attributable to emerging truth about the virus. However, it also noted other factors that could cause the models to converge:

> The researchers say that they are getting better at understanding the dynamics of the pandemic as Americans largely shelter in place, and that improved knowledge may explain the growing consensus of the models. The near-term future of the pandemic is also a little easier to imagine, with deaths flattening instead of growing rapidly. There may be some peer pressure, too. Nicholas Reich, a biostatistician at the University of Massachusetts who has led a project to standardize and compare model outputs, said he worried about the temptation to "herd" outputs. "Probably no one wants to have the really super-outlying low model or the super-outlying high model," he said.

The challenge of getting to truth—through data—for making optimal decisions is as much a problem in structured finance as in epidemiology. Data suppliers provide mountains of loan-level data for investors to use in trading structured finance securities. But does the data reflect the truth? The question is important because, long after a security is issued, investors continue to use data about initial loan characteristics as part of their analyses and decision making.

The aftermath of the 2007 mortgage meltdown brought revelations of widespread misrepresentation (and sometimes fraud) in connection with the sale of mortgage-backed securities (MBS) in the years preceding the meltdown. Post-meltdown litigation revealed high rates of material undisclosed defects in securitized mortgage loans. False data often applied to half or more of the loans in a deal. For example, in *Assured Guar. v. Flagstar,* the court agreed with expert findings of a defect rate above 75%.[1] Similarly, in *FHFA v. Nomura*, the court found defect rates ranging from 45% to 59% in the private-label MBS deals covered in that case.[2] Other public sources produced similar findings. An example is Deutsche Bank's 2017 settlement with the US Department of Justice (DOJ), which recounts a number of similar instances.[3] In my consulting work, I have observed a comparably high prevalence of false data in MBS pools.

But the problem is actually worse. Even though the broad extent of false data in MBS has been revealed, the data continues to be used by investors and disseminated by data distributors as if it were true. I do not know of any instances where data on a trustee website, Bloomberg, or Intex was updated or corrected based on the discoveries made through litigation or DOJ investigations. If the data coming from trustee websites or data vendors is false, analysis based on it will be flawed. Are investors and other market participants just kidding themselves when they rely on false data to feed their risk and valuation models? Are trustees and data vendors culpable for continuing to disseminate data after they know, or reasonably should know, that much of it is false? Do investment managers and advisors fulfil their duties if they make decisions or offer recommendations based on such data?

The wildly incorrect early projections about the spread of the Coronavirus show the danger of relying on false data. Moreover, the seemingly intentional suppression of the truth about the virus both undermined later modeling efforts and actually exacerbated its spread. In that vein, should we be asking whether the ongoing use of untrue data causes errors in valuation and risk management that amplify over time?

Truth matters. Not necessarily in the short run, but eventually it catches up. Paraphrasing Dr. Martin Luther King, Jr., a medical researcher wrote in 2018 that "the arc of the research universe is long, but it bends toward the truth" (Brar 2018).

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[1] *Assured Guaranty Municipal Corp. v. Flagstar Bank*, 920 F. Supp. 2d 475, 487 (S.D.N.Y. 2013) https://www.leagle.com/decision/inadvfdco131219000160.

[2] *Federal Housing Finance Agency v. Nomura Holdings America et al.*, 104 F. Supp. 3d 441, 52021 (S.D.N.Y. 2015) https://cite.case.law/f-supp-3d/104/441/, aff'd. 873, F.3d 85 (2d Cir. 2017), cert. denied 138 S.Ct. 2679 (No. 17 1302, 25 Jun 2018).

[3] Deutsche Bank–DOJ Settlement Agreement, Statement of Facts ¶¶ 99, 113 (Jan. 17, 2017), https://www.justice.gov/opa/press-release/file/927271/download

This issue of *The Journal of Structured Finance* opens with an article by Mejda Bahlous-Boldi, of the Rochester Institute of Technology (Dubai campus). She examines mortgage loan foreclosures in California from 2005 through 2017 and finds that a substantial share of losses was caused by equity extraction. She also finds that equity extraction allowed roughly a quarter of borrowers to make a profit upon the foreclosure of their homes.

The issue's second article is about using securitization to finance drug development. Authors Carlos Ortiz (Arcadi University), Charles Stone (Brooklyn College), and Anne Zissu (New York City College of Technology) explore the sensitivity of hypothetical deal structures to drug trial failure rates at different stages of the drug development process. They also examine the sensitivity of the structures to the cost of capital. Their analysis builds on the work of Fernandez, Stein, and Lo (2012) and Fangan et al. (2013), which created the idea of pharma-research securitization. Those interested in hearing more on this subject may want to listen to the video conversation between Frank Fabozzi (editor of *The Journal of Portfolio Management*) and Andrew Lo of MIT, one of the authors of the articles cited above. That video conversation should be on the Portfolio Management Research website (https://www.pm-research .com/) by the time this issue of *The Journal of Structured Finance* is released.

The third article is by Nurkhodzha Akbulaev, Ilkin Mammadov, and Mehbube Hemdullayeva, all from the Azerbaijan State University of Economics. They examine the relationship of price movements of bitcoin and ethereum, the two leading cryptocurrencies. They find a linkage between the two that may be useful for diversification and risk management in trading cryptos.

The issue's fourth article is by Paul Forrester and James Antonopoulos, both partners at Mayer Brown. They discuss the NCUA safe-harbor rule that permits credit unions to effect securitizations like banks do. Although the safe-harbor rule has been around for more than 2 years, the first auto asset-backed securities deal by a credit union happened only recently.

The fifth article is by Gireesh Shrimali of Stanford University. He proposes using a government-sponsored credit guarantee mechanism to promote rooftop solar projects in India. He concludes that such a mechanism can help India achieve its target of producing 40 gigawatts of power from rooftop solar by 2022.

The issue's sixth article is by Patrick Tadie and Joseph Deller, both of Wilmington Trust. They examine problems associated with the enforcement of representations and warranties (R&Ws) in MBS transactions. They propose a two-pronged solution to ameliorate the problems. One prong is using blockchain technology to permanently attach the applicable underwriting and servicing guidelines to the data record for each loan when it is originated. This would address the problem of not being able to find the guidelines later. The second prong would be to change the enforcement framework so that enforcement would occur only after a loan produces a loss caused by an R&W breach. I suspect that the first prong would receive broad support in the securitization community but that investors would resist the second.

This issue also includes my report on the "CLOs and Leveraged Loans 2020" virtual event that took place in June. The report covers seven sessions from the event, including the general sessions and the keynote address. As usual, this issue includes highlights from *GlobalCapital* and a selection of industry news items from the Structured Finance Association, in both cases covering Q2 2020.

As always, we welcome your submissions. Please encourage those you know who have good papers or who have made good presentations on structured finance- or project finance-related subjects to submit them to us.

Submission guidelines can be found at http://jsf .pm-research.com/authors. If you have comments or suggestions, you can e-mail me directly at M.Adelson@ PageantMedia.com.

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