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“Knowledge of truth is always more than theoretical and intellectual. It is the product of activity as well as its cause. Scholarly reflection therefore must grow out of real problems, and not be the mere invention of professional scholars.”

JOHN DEWEY, UNIVERSITY OF VERMONT

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LAUREN DAVIS ELECTED TO THE IIF BOARD

Congratulations to *Foresight* Advisory Board member Lauren Davis, who was recently elected to the IIF's Board of Directors. Lauren is a Professor in the Department of Industrial and Systems Engineering at North Carolina A&T State University, and her research focuses on stochastic modeling of supply chain systems, particularly with application to hunger relief. See Lauren's article on page 43 of this issue on the role of forecasting to end global hunger.



PREVIEW OF FORESIGHT ISSUE 78

Issue 78 begins with **Yue Li** and **Rachel Pedersen** taking a deep look into the part that generative AI will play in the future of demand forecasting. They note that gen AI is still evolving, but has the potential to enrich existing forecasting frameworks even if not a replacement for forecasting expertise. They also warn that strong AI governance is needed to ensure data quality and reliability.

Continuing in the AI/ML space, **Joost van der Haar**, **Yves Sagaert**, and **Robert Boute** investigate the integration of forecasting and inventory decisions using machine learning. In their study of three Belgian companies in the food industry, they find that better forecasts do not necessarily lead to better inventory decisions. Instead, predicting optimal order quantities directly can result in substantial cost savings for smoother time series.

Forecast errors are inevitable, but not all errors are created equal. So goes the argument by **Kolja Johannsen**, who categorizes four types of forecast errors and provides strategies for responding to them. As he shows, being aware of the drivers behind forecast errors can help improve accuracy as well as make the forecast more useful for decision making.

Forty years ago, the “asymmetry” of mean absolute percentage error was noted by Scott Armstrong. Forecasts that exceeded the actual were penalized more harshly by MAPE than forecasts below the actual, introducing a possible incentive for biasing forecasts to the low side. Various flavors of *sMAPE* – purporting to provide symmetry – were introduced, and **Rob Hyndman** opens our special feature on Revisiting Symmetric MAPE with a recap of that history.

Slawek Smyl continues the discussion with a proposed new metric he calls *Sparse-Proof MAPE* (msMAPE), designed to better handle large-valued as well as sparse (intermittent) time series when forecasts and actuals are non-negative. **Stephan Kolassa** ends the special feature with a commentary on Smyl's msMAPE and a call for using simulation to better understand what any error metric does in a variety of situations.

The “explainability” of a model has become an important element in forecasting. This is especially true with the increased reliance on machine learning models that lack transparency into what variables are driving the forecast. **Trevor Siderly** argues that explainability is a requirement for trust in forecasts and categorizes four types of explainability requirements involving methods, components, drivers, and errors. Since each business user may have a different understanding of explainability, these varied understandings can affect what models the forecaster uses.

In a pair of commentaries, **Anne-Flore Elard** looks at the distinction between explainability and explanations and notes that when models lack a direct mapping with business drivers, this creates a roadblock to their trust and adoption. Then **Zabiulla Mohammed** agrees that explainability is important for building trust, but not at the expense of predictive power or business value.

In *Foresight* issue 74, Bahman Rostami-Tabar and I raised the question of forecasting's role in supporting the United Nations' Sustainable Development Goals. In response, **Lauren Davis** looks at the role of forecasting in ending global hunger, and **Leo Sadovy** addresses its part in life below water.

Frequent book review contributor **Ira Sohn** delivers another, this time examining David Spiegelhalter's *The Art of Uncertainty*. Sohn finds Spiegelhalter to have a singular command of the technicalities of statistics and probability, along with a special talent for communication that exudes confidence and trust. He considers the book an engaging and entertaining read.

Issue 78 concludes with an Op-Ed by **Malte Tichy** on the overcategorization of continuous data. In the most egregious cases, "category hacking" occurs when different category splits are tested until one happens to be statistically significant. Tichy argues that binary decisions don't necessarily require binary categorization of the data and that prematurely classifying continuous quantities is often a lazy shortcut that can impact the quality of the analysis.

IIF COMPETITION PAPERS COMING IN ISSUE 79

The Q4 issue, publishing in October, will feature papers from IIF Competition winner Wayfair and the four other finalists: HP, Ipiranga, Maersk, and OpenGrid Europe.

- **Wayfair** describes their hierarchical forecasting engine that ensembles top-down time series and bottom-up machine learning forecasts to predict monthly demand.
- **HP** shows how it pairs large-scale machine learning forecasts with human insight.
- **Ipiranga** forecasts at multiple levels and different time horizons to manage fuel distribution.
- **Maersk** utilizes a statistical/ML-based automated forecast system to support granular and efficient repositioning of empty containers.
- **OpenGrid Europe** tackles the challenge of forecasting hourly gas flows using a hybrid approach combining ML, time series analysis, and optimization.



"How are the mighty fallen!"

—Mike Gilliland
Dragonfly Farm
Seagrove, N.C.
USA