

Marketing Research Seminar Series | Department of Marketing | WU Vienna

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Metrics Unreliability and Marketing Overspending

ABSTRACT

The adverse consequences of measurement unreliability on statistical issues (e.g., inconsistency, attenuation bias) are well known. Yet there exists sparse literature, if any, on how unreliable metrics affect marketing outcomes: optimal marketing budget, its optimal allocation to advertising and promotions, and overspending. Consequently, researchers and managers do not know: How to optimally set the total marketing budget and optimally allocate it to advertising and promotions activities using unreliable sales metrics? How to optimally combine multiple noisy and biased metrics? How to estimate dynamic demand models using unreliable data?

To answer these open questions, first, based on Kalman filtering theory, we show how to estimate and infer dynamic demand models using unreliable sales metrics. Then, we furnish evidence of significant measurement noise in both retail audit and company's internal data to track brand sales. We replicate these results across six largest political regions in the emerging Indian markets for a major hair care brand. Next, we analytically derive the optimal weights to combine noisy and biased metrics to infer the latent demand. This result uncovers a counter-intuitive insight that two noisy metrics are better than one even when the second metric is noisier. In other words, a composite metric serves as noise reduction device as it is more reliable than individual noisy metrics. Subsequently, we derive closed-form expressions for the optimal budget and its optimal allocation to advertising and promotions activities in the presence of unreliable sales metrics. Based on these results, we prove that overconfidence—the presumption that the metrics are reliable—leads to overspending on advertising and promotions. Finally, we provide a simple correction factor that managers can use to eliminate overspending.

Keywords: Dynamic Models; Measurement Noise; Optimal Budget and Allocations; Kalman Filter Estimation; Emerging Markets