

Introducing Human Behaviours to the Analytics of Pricing



Ioana Popescu

Professor of Decision Sciences

Popescu's impact in brief

- ▶ Popescu is one of the most influential and innovative scholars in the field of revenue management. Her creative approach to understanding how consumers think and why they make the choices they do has had implications on pricing models globally.
- ▶ A pioneer in the field of pricing analytics, Popescu has published studies on stochastic optimisation that helped to expand the practice outside the airline and hotel sectors.
- ▶ Her research in media, which applied pricing tools to the way broadcasting companies sell advertising, was revolutionary. Her paper [Media Revenue Management with Audience Uncertainty: Balancing Upfront and Spot Market Sales](#) won the 2012 Manufacturing & Service Operations Management Best Paper Award.
- ▶ Popescu has published papers in leading academic journals, including Management Science and Operations Research. She has been cited 2452 times, a significant number in a niche field.
- ▶ An artist at heart, Popescu has lived on four continents and was honoured as a Young Global Leader (2009) by the World Economic Forum.
- ▶ <https://www.insead.edu/faculty-research/faculty/ioana-popescu>

Nuru Energy had received \$2 million in scale-up funding, hired a dozen staff in four countries and was preparing to move into the final stage of its development when founder Sameer Hajee made a frustrating discovery – his pricing model didn't add up.

Nuru was working to replace kerosene lamps with pedal-powered, rechargeable lights in Rwanda's poor, off-grid communities. Despite meticulous research, demand was not happening at the price point the firm had set. Was it the wrong upfront price? Did the recharge price need changing? Were households not coming back often enough?

Hajee was deliberating over his next move while checking in to the 2014 World Economic Forum in Davos when he had a fortuitous meeting with INSEAD Professor of Decision Sciences Ioana Popescu.

An expert in revenue management and a pioneer in modern pricing, Popescu had been looking for ways to inject more purpose into her work and jumped at the idea of helping a business dealing with the bottom-of-

the-pyramid. Enlisting the collaboration of colleagues, she organised a randomised controlled trial (RCT) to figure out why people were forgoing Nuru's more cost-effective lighting option. Among its findings the RCT found that an important driver of this seemingly irrational choice by customers was convenience; kerosene was more expensive but it offered more purchasing flexibility than rechargeable bulbs. It was also more affordable for people with cash flow difficulties.

Leading the integration of emotions into revenue management

Understanding the factors that contribute to customers' purchase decisions is one of the great complexities of pricing and something that many businesses still grapple with.

Popescu broke new ground early in her career by recognising the powerful impact that human behaviour has on consumer decision making. She saw that many pricing tools were less accurate than they should be

because they wrongly assumed all customers acted in a rational way. By integrating ideas from psychology and marketing into her pricing research, something that had never been done before in the analytics field, she was able to take a deeper look at why customers acted as they did and examine the effect of human behaviours and emotions such as loyalty, anticipation and regret.

Her trailblazing work in what became known as behavioural revenue management triggered a new stream of literature which spread and led to the opening up of the field of behavioural operations.

“Ioana’s research has been extremely influential,” notes Georgia Perakis, William F. Pounds Professor of Operations Research and Operations Management at the Sloan School of Management.

“Her paper [Dynamic Pricing Strategies with Reference Effects](#) was the first to present the idea that consumers have memory and are prone to human decision-making biases and cognitive limitations. It was very different at the time and paved the way for people to start paying attention to these factors when developing their own pricing models. From there the ideas have really expanded.”

A pioneer of pricing analytics

Popescu’s unique ability to connect the dots while jumping between different fields such as decision making, psychology and operations management has been the key to much of her ground-breaking research. When she started her career, the fields of pricing and revenue management were two very different concepts: Prices were generally fixed and revenue management was largely a matter of inventory. She saw the benefits of integrating them and, drawing from her background in probability and optimisation, developed tools to figure out demand, calculate optimal prices and allocate capacity.

Her work was at the vanguard of a movement that saw pricing analytics move out of the sphere of airlines to assist hotels, retail, manufacturing and other sectors.

“Ioana is a thought leader and one of the most well-known people in the revenue management industry today,” said Ahmet Kuyumcu, co-founder and CEO of the US pricing solution firm Prorize LLC.

Kuyumcu worked with Popescu to create models for the Las Vegas apartment and gaming industries. Her theorems took in incredibly complex conditions – creating models that worked for apartments with up to 64 customer segments in times of oversupply and overdemand – and contributed to the development of software used by 90 percent of the gaming industry today.

Ongoing Impact

In the recent past, Popescu has focused her research in emerging economies, developing innovative models to improve access to finance and energy for unserved markets.

While Popescu’s work has great practical implications, her papers are largely theoretical and focused on planting ideas for other academics to apply in more practical settings.

“I believe the most important way to impact business directly is in the classroom,” she noted.

“This is where we disseminate experientially the insights from research, empowering participants to take the knowledge back into the heart of industry.”

Concerned by the lack of education around pricing analytics, twenty years ago Popescu designed and presented the first ever MBA elective on Dynamic Pricing and Revenue Management, an INSEAD programme that was later picked up by Columbia and Stanford business schools. Her dedication and innovative style in the classroom won her the INSEAD Outstanding Teacher Award 2011.

Ioana’s journey is now taking her deeper into understanding the essence of human behaviour and decision making with a new embodied programme on authentic decisions.