

**NYU Stern School of Business**  
**Department of Information, Operations & Management Sciences**  
**OPERATIONS MANAGEMENT RESEARCH SEMINAR**

**TOPIC: Strategic Consumers, Revenue Management and the Design of Loyalty Programs**

**SPEAKER: Anton Ovchinnikov (Queen's School of Business)**

**DATE: Wednesday, April 29, 2015**

**TIME: 11:00 AM-12:00PM**

**PLACE: KMC 4-110**

**ABSTRACT**

In this paper we study an interaction between pricing / revenue management and premium-status loyalty program (e.g., a "Gold" status with an airline or hotel), and the role of strategic consumers in this interaction. Specifically, we consider a recent change where several major airlines switch their "frequent-flyer" loyalty programs from "mileage-based" programs (under which consumers obtain the premium status by flying a certain number of miles) toward "spending-based" programs (under which consumers obtain the premium status by spending a certain number of dollars). This change has been met with a fierce opposition from media and consumers.

We present a novel model for forward-looking, status-seeking, strategic consumers' decisions on how much to purchase/fly over a certain time-period. We consider consumer heterogeneity along two fundamental dimensions, utility of time and money, and endogenously derive the consumer demand as a function of the firm's prices, loyalty program design, and premium status qualification requirements. We then incorporate such strategic consumers' demand into the firm's pricing and loyalty program design problem, compare the solutions under the two designs (mileage-based versus spending-based), and discuss managerial implications.

We demonstrate a number of interesting findings. First, we confirm that the so-called "mileage-runs" (flying more to maintain the premium status in the mileage-based program design), which are often observed in practice, are indeed utility maximizing strategic behaviors. Similarly, under the spending-based program design, some consumers may choose to "spend-up" (strategically pay more for the same product or service in order to qualify for the premium status). Second, in contrast to most of the existing research, we demonstrate that when the firm coordinates its pricing and loyalty program, it can, in fact, benefit from strategic consumer behavior, i.e., its profit is higher when consumers are strategic than when they are myopic. Further, the benefit from strategic consumer behavior is even larger under the spending-based programs, which substantiates the change observed in the industry: the profit under the spending-based program (with the corresponding optimal prices and status qualification threshold) is larger than under the mileage-based program. This additional profit, however, comes not only from the additional revenue, but also from a decrease in the costs of servicing premium-status consumers: such consumers spend more per flight but take fewer flights. Third, we also investigate the impact of the change on different types of consumers and characterize the consumers who benefit or suffer from being strategic and from the switch. Finally, and most surprisingly, we show that a switch to the spending-based program can lead to a win-win situation where the firm's profit will

increase yet no consumer will be worse-off. This is particularly interesting in light of the extremely negative public reactions to the change toward spending-based loyalty programs. However, implementing such a win-win solution may require the firm to deviate from optimum and sacrifice a small portion of its profit for the benefit of consumers.

## **BIO**

Anton Ovchinnikov is an Associate Professor of Operations Management and Management Science at the Queen's School of Business in Kingston, Canada. His research interests include, on the theoretical side, behavioral operations, revenue management and environmental sustainability. On the applied side, he studies data-driven applications in business, government and nonprofit sectors.

Anton's work has been published in the leading academic journals; his case studies won the 2005 and 2011 Case Competitions held by the Institute of Operations Research and Management Sciences (INFORMS). One of his academic papers was recognized as the finalist of the 2009 INFORMS Junior Faculty Best Paper Competition, and his applied work was recognized as the finalist in the 2014 INFORMS Revenue Management and Pricing section Practice Prize. Anton organized several conferences and is on the editorial review boards of two leading operations management journals; his contributions to the academic community received multiple awards.

Prior to joining Queen's Anton taught data and decision analysis courses at the University of Virginia, management science and supply chain management courses at the University of Toronto, as well as in multiple executive education programs around the world. He holds a specialist degree in economics from his hometown university in Krasnoyarsk, Russia, and a PhD in operations management from the University of Toronto. Before starting his academic career, he worked in Germany, the Netherlands and Russia in the area of commercializing high-tech developments and co-owned a business in industrial and architectural design.