

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/233485534>

# The Theory and Practice of Revenue Management

**Article** in *Journal of Revenue and Pricing Management* · January 2005

DOI: 10.1057/palgrave.rpm.5170123

---

CITATIONS

143

---

READS

2,140

1 author:



[Warren Lieberman](#)

Veritec Solutions

26 PUBLICATIONS 457 CITATIONS

SEE PROFILE

## **Book Review**

### **The Theory and Practice of REVENUE MANAGEMENT**

By Kalyan T. Talluri and Garrett J. van Ryzin (Kluwer Academic Publishers; 2004;  
ISBN 1-4020-7701-7; 712 pp hardcover)

Kalyan Talluri and Garrett van Ryzin's "The Theory and Practice of RM" is the first serious attempt to provide a comprehensive understanding of the mathematics and business concepts underlying Revenue Management. It succeeds admirably in its effort. Talluri and van Ryzin's book sets a strong standard for future revenue management books to be measured against.

As noted by the authors, "The Theory and Practice of Revenue Management" is written for two audiences: (1) analytically trained practitioners in industry and (2) academic researchers and teachers. The book provides an in-depth review of forecasting and optimization approaches that support revenue management decision making as well as a variety of economic theories supporting and closely related to revenue management. Most of the material and examples are taken from the airline industry, although short excursions are taken into other industries. The book includes qualitative understandings of what the mathematics mean, but revenue management practitioners without a strong mathematical background (and interest) will find the book a tough read.

The book is extraordinarily strong in its presentation of technical and conceptual aspects of revenue management. Treatment of these areas is thorough. The discussion of industry applications, excepting the airline industry, is incomplete and can best be characterized as a high level summary. The book is for those who want a stronger understanding of the modeling approaches and concepts upon which revenue management systems are based; it is not for those who want to understand how revenue management is practiced.

The book is divided into three sections. The first, about 25 percent of the book, focuses on quantity-based revenue management. Chapters are included on Single-Resource Capacity Control (e.g., capacity control of multiple prices/fares on a flight leg), Network Capacity Control, and Overbooking. Section Two focuses on price-based revenue management and includes chapters on Dynamic Pricing and Auctions. In Section Three, Talluri and van Ryzin turn their attention to elements of revenue management that relate to both quantity and price-based revenue management. This Section consists of five chapters. The first three chapters are Customer Behavior and Market-Response Models, The Economics of RM (a wide variety of economic theories are described), and Estimation and Forecasting. The final two chapters of this section provide overviews of industry practices and an assortment of implementation issues.

Quantity-based revenue management was originally termed yield management in the airline industry. Airline yield management was very narrowly defined, possessing three

primary areas: (1) controlling the availability of discounted fares (it should be noted that setting the fares was outside the scope of yield management), (2) itinerary controls and (3) overbooking. Up until 1990, almost all of the advances in the theory of quantity-based revenue management were carried out by practitioners; in particular, by practitioners in the airline industry. In some ways, the early days of yield management may have been similar to the early days of operations research. Advances in yield management theory were motivated by a need to solve actual problems. Alternative solutions, based on advances in the theory, were tried out; some succeeded and others did not. Progress was fairly rapid and there was a great deal of excitement when practical approaches proved out.

As interest in yield management expanded, so did the scope of yield management theory. Changes in the nomenclature resulted. Practitioners stopped being the primary source for research and theoretical advances. Yield management was rebranded as revenue management, as the term “yield management” was less acceptable to business executives outside the airline industry. Over time, and as the concepts of yield management spread to more and more industries, the discipline began to include price-based decision supports as well as inventory control-based decision supports. The fact that the authors find it useful to distinguish between “quantity” and “price” based revenue management is indicative of this expansion. (Interestingly, the increasing reach and impact of low cost airlines has also begun to push the airline industry towards price-based revenue management over the past few years).

While some theoretical advances in the field continued to be a direct result from efforts to capitalize on practical opportunities (e.g., addressing network effects), the expansion of interest in yield management also led to broadening the theory to areas where the opportunities to turn theory into practice became less clear or faced much greater implementation challenges. In particular, during the 1990's and especially during the past several years, yield management efforts began to incorporate pricing. The book's Second Section reflects this shift as the link between the theory in this section and actual revenue management applications become more tenuous than in the first section. The fact that a Chapter on auctions could find its way into a book on Revenue Management indicates how much broader the definition of revenue management has become in the past decade.

Section Three focuses on underlying modeling approaches that have long been part of revenue management as well as modeling approaches that have only more recently entered the discipline. Chapter 9 reviews a number of forecasting approaches and should be required reading for anyone who needs (or wants) to understand traditional demand forecasting approaches in revenue management. The graphics used in this chapter provide excellent visual aids towards understanding the material presented. Chapter 8, which delves into a variety of economic models in differing market conditions (e.g., perfect competition, monopoly, and oligopoly), is a bit further removed from traditional applications of revenue management, although the authors make efforts to tie the two together.

Chapter 10 is focused on profiling the use of revenue management in 15 industries and Chapter 11 discusses a variety of implementation issues. Of all the material in the book, these are weakest chapters. A thorough discussion of the practice of revenue management in more than 15 industries, along with the challenges of implementation could easily command a separate volume and perhaps this will be corrected in a future edition of the book. At approximately 2 - 8 pages per industry, however, the discussion can do no more than highlight and occasionally oversimplify key issues; in some industries, the material presented is simply incorrect or is, at least, contrary to my experience. For many hotels, improved control over accepting reservations based on length-of-stay can be the single most important factor in generating increased revenues and profits; this fundamental piece of information is never brought out in the hotel section. In the rental car industry, the costs associated with an actual car rental can make several one-day rentals much less profitable (i.e., less net revenue) than a multiple-day rental, when the total number of rental days and total revenue generated are the same; accounting for this should be a key element of a rental car revenue management system, but this is not noted. The profile of cruise and ferry lines states that “overbooking for the ship as a whole is generally not practiced;” I’ve worked with most of the major cruise lines and they all overbook at the ship level.

Chapter 11 suffers from much of the same weaknesses as Chapter 10. To their credit, Talluri and van Ryzin try to touch on many of the implementation issues that affect revenue management performance, beyond the revenue management system and the underlying models. Unfortunately, the analysis rarely goes beyond the high level review

and again, key pieces of information are not included. Organizational challenges and training/educational needs receive a superficial treatment. The performance measurement section consists mostly of simulation opportunities and doesn't even mention the use of specially designed revenue management operating metrics. Even a technical treatment of how different business environments have an impact on forecasting and optimization is lacking. This is particularly unfortunate because industry-specific issues can have a great impact on the type of revenue management modeling approaches that are likely to work best.

But I do not want to end this review with a discussion of the book's weaknesses. The Theory and Practice of Revenue Management is a superb book. I expect that this book will eventually be found on the bookshelf of virtually everyone who assumes responsibility for designing revenue management systems and decisions support tools. It certainly should be.

**Warren Lieberman**

**President, Veritec Solutions**