

SUPPLY CHAIN STRUCTURES

Coordination, Information and Optimization

Edited by

JING-SHENG SONG

University of California, Irvine

DAVID D. YAO

Columbia University



Kluwer Academic Publishers
Boston/Dordrecht/London

Contents

✓uou

1		
Introduction and Overview		1
<i>Jing-Sheng Song and David D. Yao</i>		
1. Structures, Flexibility, and Coordination		2
2. Value of Information		3
3. Optimization, with Industrial Applications		4
4. Inventory-Service Tradeoff under Demand Correlation		5
2		
Efficient Supply Chain Structures for Personal Computers		7
<i>Lingxiu Dong and Hau L. Lee</i>		
1. Introduction		7
2. Literature Review		11
3. Distribution Channel Structures and Supply Chain Performance		12
4. Postponement in Channel Assembly		25
5. Conclusions and Discussions		31
6. Appendix: Notation		33
7. Appendix: Proofs		36
3		
Intrafirm Incentives and Supply Chain Performance		45
<i>Narendra Agrawal and Andy A. Tsay</i>		
1. Introduction		45
2. Model Assumptions		48
3. Analysis of Control System M		50
4. Analysis of Control System R		54
5. Analysis of Control System C		56
6. Comparing the Control Systems		57
7. Conclusion		63
8. Appendix: Proofs of Theorems		64
4		
Impact of Manufacturing Flexibility on Supply Chain Performance in the Automotive Industry		73
<i>Stephan Biller, Ebru K. Bish and Ana Muriel</i>		
1. Introduction and Motivation		73
2. The Automotive Supply Chain		75

3.	Model Overview and Analytical Results	81
4.	A Simulation Study	102
5.	Conclusions and Directions for Future Research	113
5		
	<i>Optimal Use of Demand Information in Supply Chain Management</i>	119
	<i>Guillermo Gallego and Özalp Özer</i>	
1.	Introduction	119
2.	Using Current Demand Information	121
3.	Using Advance Demand Information	130
4.	Directions for Future Research	156
6		
	<i>Supply Chain Information Sharing in a Competitive Environment</i>	161
	<i>Lode Li and Hongtao Zhang</i>	
1.	Introduction	161
2.	The Models	163
3.	Cournot Retailers and a Homogeneous Product	167
4.	Make-to-Stock Manufacturer	177
5.	Duopoly Retailers with Differentiated Goods	183
6.	Information about Cost Uncertainty	194
7.	Conclusions and Future Research	199
8.	Bibliographical Notes	201
7		
	<i>Planning and Scheduling in an Assemble-To-Order Environment: Spicer-Off-Highway Products Division</i>	207
	<i>Nico J. Vandaele and Marc R. Lambrecht</i>	
1.	Introduction	207
2.	The Business Case: Spicer-Off-Highway	208
3.	The ACLIPS Approach	213
4.	Methodological Issues	226
5.	The Results of ACLIPS	247
6.	Conclusion	252
8		
	<i>Network Server Supply Chain at HP: A Case Study</i>	257
	<i>Dirk Beyer and Julie Ward</i>	
1.	Introduction	257
2.	Problem Description	261
3.	Related Literature	266
4.	The Model	268
5.	Approach	270
6.	Sample Results	276
7.	Conclusion	279

9		
	Inventory Allocation at a Semiconductor Company	283
	<i>Alexander O. Brown, Markus Ettl, Grace Y. Lin, Raja Petrakian</i> and <i>David D. Yao</i>	
	1. Introduction	284
	2. Production-Inventory Planning at Xilinx	286
	3. Problem Formulation	289
	4. The Optimization Algorithm	292
	5. Safety-Stock Constraints	295
	6. Numerical Results	298
	7. Summary and Conclusions	307
10		
	Leadtime, Inventory, and Service Level in ATO Systems	311
	<i>Yashan Wang</i>	
	1. Introduction	311
	2. The Model and the Asymptotic Fill Rate	314
	3. Leadtime-Inventory Trade-Offs	320
	4. Cost Optimization	330
	5. Proofs	344
	6. Concluding Remarks	353
11		
	Dependence Analysis of Assemble-to-Order Systems	359
	<i>Susan H. Xu</i>	
	1. Introduction	359
	2. The Approach and Main Results	365
	3. The Model and Performance Measures	369
	4. Dependence Orders of Product-Type Indicator Vectors	374
	5. Capacitated Assemble-to-Order Systems	383
	6. Uncapacitated Assemble-to-Order Systems	392
	7. Performance Bounds	396
	8. Summary	408
	9. Appendices	409
12		
	Inventory Policies for Sequences of Multi-Item Demands with No Backorders Permitted	415
	<i>John W. Mamer and Stephen A. Smith</i>	
	1. Introduction	415
	2. The Model	418
	3. Two Examples	429
	4. Conclusion	434