Full text available at: http://dx.doi.org/10.1561/170000002

Customer Equity: Measurement, Management and Research Opportunities

# Customer Equity: Measurement, Management and Research Opportunities

## Julian Villanueva

IESE Business School Camino del Cerro del Águila, 3 28023 Madrid, Spain, villanueva@iese.edu

## Dominique M. Hanssens

UCLA Anderson School of Management, 110 Westwood Plaza Los Angeles, CA 90095-1481 USA, dominique.hanssens@anderson.ucla.edu



Boston – Delft

# Foundations and Trends $^{\ensuremath{\mathbb{R}}}$ in Marketing

Published, sold and distributed by: now Publishers Inc. PO Box 1024 Hanover, MA 02339 USA Tel. +1-781-985-4510 www.nowpublishers.com sales@nowpublishers.com

Outside North America: now Publishers Inc. PO Box 179 2600 AD Delft The Netherlands Tel. +31-6-51115274

Library of Congress Control Number: 000000000000

The preferred citation for this publication is J. Villanueva and D. M. Hanssens, Customer Equity: Measurement, Management and Research Opportunities, Foundations and Trends<sup> $\mathbb{R}$ </sup> in Marketing, vol 1, no 1, pp 1–96, 2007

Printed on acid-free paper

ISBN: 1-60198-010-6 © 2007 J. Villanueva and D. M. Hanssens

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, mechanical, photocopying, recording or otherwise, without prior written permission of the publishers.

Photocopying. In the USA: This journal is registered at the Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923. Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by now Publishers Inc for users registered with the Copyright Clearance Center (CCC). The 'services' for users can be found on the internet at: www.copyright.com

For those organizations that have been granted a photocopy license, a separate system of payment has been arranged. Authorization does not extend to other kinds of copying, such as that for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. In the rest of the world: Permission to photocopy must be obtained from the copyright owner. Please apply to now Publishers Inc., PO Box 1024, Hanover, MA 02339, USA; Tel. +1 781 871 0245; www.nowpublishers.com; sales@nowpublishers.com

now Publishers Inc. has an exclusive license to publish this material worldwide. Permission to use this content must be obtained from the copyright license holder. Please apply to now Publishers, PO Box 179, 2600 AD Delft, The Netherlands, www.nowpublishers.com; e-mail: sales@nowpublishers.com

# Foundations and Trends<sup>®</sup> in Marketing Volume 1 Issue 1, 2007 Editorial Board

Editor-in-Chief: Jehoshua Eliashberg University of Pennsylvania

### **Co-Editors**

**Teck H. Ho** University of California Berkeley

Mary Frances Luce Duke University

#### Editors

Joseph W. Alba, University of Florida David Bell, University of Pennsylvania Gerrit van Bruggen, Erasmus University Pradeep Chintagunta, University of Chicago Dawn Iacobucci, University of Pennsylvania Brian Sternthal, Northwestern University J. Miguel Villas-Boas, University of California, Berkeley Marcel Zeelenberg, Tilburg University

## **Editorial Scope**

Foundations and Trends<sup>®</sup> in Marketing will publish survey and tutorial articles in the following topics:

- B2B Marketing
- Bayesian Models
- Behavioral Decision Making
- Branding and Brand Equity
- Channel Management
- Choice Modeling
- Comparative Market Structure
- Competitive Marketing Strategy
- Conjoint Analysis
- Customer Equity
- Customer Relationship Management
- Game Theoretic Models
- Group Choice and Negotiation
- Discrete Choice Models
- Individual Decision Making

- Marketing Decisions Models
- Market Forecasting
- Marketing Information Systems
- Market Response Models
- Market Segmentation
- Market Share Analysis
- Multi-channel Marketing
- New Product Diffusion
- Pricing Models
- Product Development
- Product Innovation
- Sales Forecasting
- Sales Force Management
- Sales Promotion
- Services Marketing
- Stochastic Model

#### Information for Librarians

Foundations and Trends<sup>®</sup> in Marketing, 2007, Volume 1, 4 issues. ISSN paper version 1555-0753. ISSN online version 1555-0761. Also available as a combined paper and online subscription.

Foundations and Trends<sup>®</sup> in Marketing Vol. 1, No 1 (2007) 1–96 © 2007 J. Villanueva and D. M. Hanssens DOI: 10.1561/170000002



### Customer Equity: Measurement, Management and Research Opportunities

# Julian Villanueva<sup>1</sup> and Dominique M. Hanssens<sup>2</sup>

- <sup>1</sup> IESE Business School, Camino del Cerro del Águila, 3, 28023 Madrid, Spain, villanueva@iese.edu
- <sup>2</sup> UCLA, Anderson School of Management, 110 Westwood Plaza, Los Angeles, CA 90095-1481 USA, dominique.hanssens@anderson.ucla.edu

#### Abstract

Despite the recent academic interest in the study of customer equity (CE henceforth), a comprehensive discussion of the prevailing research issues has not been provided. There is a shift in the interest of managers and researchers from a traditional focus on product management to a more recent focus on customer relationship management (CRM). We believe that research on CE could provide the necessary tools to link CRM to long-term financial performance. In this paper, we (a) discuss the academic and strategic importance of CE, (b) provide an extensive literature review, and (c) prioritize future research. We argue that there are two major agendas for future research in CE. The first is to provide better measures (e.g. the measurement of customer lifetime value), and the second is to identify the strategies that lead to CE maximization. We emphasize modeling approaches that have been used or could be used to tackle the suggested research questions. A special focus is given to statistical models that are capable of incorporating long-run dynamics.

# Contents

1 I	ntroduction	1
2 N	Models to Compute Customer Equity	5
2.1	Definitions of Customer Equity	6
2.2	Customer Equity Versus Brand Equity	7
2.3	Building Complete Customer Equity Models	10
2.4	A Typology of Customer Equity Models	15
2.5	Future Directions	27
3 I	Drivers of Customer Equity: The Acquisition Effort	31
3.1	Optimal Acquisition Spending	33
3.2	Identifying the Best Prospects	35
3.3	Acquisition Budget Allocation	37
3.4	Future Directions	38
4 I	Drivers of Customer Equity: Customer Retention	41
4.1	Determinants of Customer Retention	42
4.2	The Relationship Between Customer Retention	
	and Profitability	46
4.3	Models to Estimate the Probability of Retention	52
4.4	Customer Defections	58
4.5	The Acquisition-Retention Interface	60

4.0 Future Directions	61
5 Drivers of Customer Equity: Add-on Selling	65
5.1 Models for Product Offering Selection	67
5.2 Predicting Individual Response to Add-on Offerings	
(Customer Selection)	69
5.3 Estimating the Potential Value of a Customer	71
5.4 Antecedents of Add-on Selling	73
5.5 Future Directions	74
6 Marketing Customization and Customer Equity Maximization	
6.1 A Framework for Marketing Customization	75
<ul><li>6.1 A Framework for Marketing Customization</li><li>6.2 The Objective Function to Maximize</li></ul>	75 77
<ul><li>6.1 A Framework for Marketing Customization</li><li>6.2 The Objective Function to Maximize</li><li>6.3 Targeted Pricing</li></ul>	75 77 78
<ul> <li>6.1 A Framework for Marketing Customization</li> <li>6.2 The Objective Function to Maximize</li> <li>6.3 Targeted Pricing</li> <li>6.4 On the Optimality of Customer Equity Maximization</li> </ul>	75 77 78 84
<ul> <li>6.1 A Framework for Marketing Customization</li> <li>6.2 The Objective Function to Maximize</li> <li>6.3 Targeted Pricing</li> <li>6.4 On the Optimality of Customer Equity Maximization</li> <li>6.5 Future Directions</li> </ul>	75 77 78 84 85
<ul> <li>6.1 A Framework for Marketing Customization</li> <li>6.2 The Objective Function to Maximize</li> <li>6.3 Targeted Pricing</li> <li>6.4 On the Optimality of Customer Equity Maximization</li> <li>6.5 Future Directions</li> <li>7 Conclusions</li> </ul>	75 77 78 84 85 <b>87</b>



The Customer Equity paradigm (CE henceforth) recognizes customers as the primary source of both current and future cash-flows. In this framework, the firm is interested in maximizing the net present value of both current and future pools of customers, which is considered a good proxy for the value of a firm (Gupta et al., 2002). Thus, CE models emerge as powerful tools to maximize the return on marketing investments, and to guide the allocation of the marketing budget (Blattberg and Deighton, 1996, Rust et al., 2004, Reinartz et al., 2005).

The roots of the current research in CE can be found on several overlapping research streams: direct marketing, service quality, relationship marketing, and brand equity (Hogan et al., 2002c). Although relationship marketing has become widely popular during the 1990s, it was used long ago by some direct marketers, small enough to address their customers individually (Petrison et al., 1997). Like direct marketing, the research streams of relationship marketing, service quality, and brand equity have focused on customer retention as one of their primary objectives. Not surprisingly, some researchers have warned against an inadequate implementation of some of these approaches. For example, it has been argued that many firms lack a clear understanding of what

#### 2 Introduction

consumers want, and annoy customers by trying to build long-lasting relationships when a transaction approach might be more adequate. Thus, these firms might be obtaining exactly the opposite of what they intended (Fournier et al., 1998). Researchers have also criticized firms obsessed with providing increasing levels of service with the objective of satisfying their customers well beyond what is economically reasonable, falling into a "satisfaction trap" (e.g., Reichheld and Teal, 1996). It has also been pointed out that, after spending huge amounts of money in Customer Relationship Management (CRM henceforth) technologies, some firms do not know how to manage customer relationships with these new databases, and have therefore achieved negative returns for these investments (Rigby et al., 2002).

In an attempt to complement the previous research streams, the literature on CE has two well-defined objectives: (i) the economic measurement of customer relationships; and (ii) the identification of strategies that build profitable relationships. Thus, CE models are about guiding resource allocation with the objective of maximizing the value of a firm.

Early work on the economic measurement of customer relationships introduced the Customer Lifetime Value model (CLV henceforth), which measures the discounted stream of cash flows of an existing customer. Nevertheless, direct marketers and firms in financial industries had implemented these techniques much earlier (Jackson 1989a, 1989b, 1989c). Recently, however, more interesting models have been developed. For example, to guide optimal resource allocation between the acquisition of new customers and the retention of existing ones (Blattberg and Deighton, 1996), or to measure the value of a firm through the value of both its current and future relationships (Gupta et al., 2002).

Eventually, the maximization of CE can be decomposed into smaller problems through the optimization of the acquisition, retention and add-on selling processes (Blattberg et al., 2001). Yet, these processes tend to be interrelated among each other and models that do not incorporate the nature of those links may be biased (Thomas, 2001).

We believe that research on Customer Equity and Customer Lifetime Value is particularly promising because it can help management practice in the following areas:

- (i) allocating marketing spending for long-term profitability,
- (ii) understanding the connection between marketing spending, marketing metrics and financial performance,
- (iii) providing a customer focused approach for measuring firm value,
- (iv) providing much needed frameworks, tools and metrics for enhancing the productivity of CRM platforms.

Put differently, managers who do not embrace a CE view of the firm, are at risk in several ways: (i) allocating resources (e.g., management focus, money) to marketing actions that produce larger shortterm gains at the expense of long-term performance (e.g., investing in acquisition channels that generate lots of new customers who subsequently defect at the first opportunity), (ii) spending on actions or monitoring metrics that do not meaningfully impact customers' behavioral change, (iii) investing in firms that may seem attractive from a standard financial perspective, but whose customer metrics (such as the monthly evolution of acquisition costs, new customers, retention rates, margins per customer) tell a different story, and (iv) investing in expensive CRM platforms without careful consideration of how these platforms will be used to grow CE.

With this paper, we try to achieve several objectives. First, we are interested in reviewing current models of CE and in providing a typology of them. Second, we are interested in reviewing models that can increase CE by optimizing each of its drivers: acquisition, retention, and add-on selling. Third, we want to posit the more fundamental questions of whether a CE orientation of a firm is beneficial when competing with other firms or not, and if firms should discriminate loyals with respect to switchers when it is possible to do so. Finally, we want to provide directions for future research in this important stream of research.

3

- Alba, J., J. Lynch, B. Weitz, C. Janiszewski, and others (1997), 'Interactive home shopping: Consumer, retailer, and manufacturer incentives to participate in electronic marketplaces'. *Journal of Marketing* 61(3), 38–53.
- Anderson, E. and D. Simester (2004), 'Long-run effects of promotion depth on new versus established customers: Three field studies'. *Marketing Science* 23(1), 4–20.
- Anderson, E. W., C. Fornell, and D. R. Lehmann (1994), 'Customer satisfaction, market share, and profitability: Findings from Swedem'. *Journal of Marketing* 58, 53–66.
- Anderson, E. W., C. Fornell, and S. K. Mazvacheryl (2004), 'Customer satisfaction and shareholder value'. *Journal of Marketing* 68(4), 172–185.
- Anderson, E. W. and V. Mittal (2000), 'Strengthening the satisfactionprofit chain'. Journal of Service Research 3(2), 107–120.
- Ansari, A. and C. F. Mela (2003), 'E-customization'. Journal of Marketing Research 40(2), 131–145.
- Bakos, J. Y. (1991), 'A strategic analysis of electronic marketplaces'. Mis Quarterly 15(3), 295–310.

- Bakos, J. Y. (1997), 'Reducing buyer search costs: Implications for electronic marketplaces'. Management Science 43(12), 1676–1692.
- Bass, F. M. (1969), 'A new product growth for model consumer durables'. Management Science 15(5), 215–227.
- Bell, D. R., J. Chiang, and V. Padmanabhan (1999), 'The decomposition of promotional response: An empirical generalization'. *Marketing Science* 18(4), 504–526.
- Ben-Akiva, M. and S. R. Lerman (1985), 'Discrete Choice Models'. MIT Press.
- Berger, P. D. and N. N. Bechwati (2001), 'The allocation of promotion budget to maximize customer equity'. Omega 29(1), 49–62.
- Berger, P. D. and N. I. Nasr (1998), 'Customer lifetime value: Marketing models and applications'. Journal of Interactive Marketing 12(1), 17–30.
- Berry, M. J. A. and G. Linoff (1997), Data Mining Techniques for Marketing, Sales and Customer Support. New York: John Wiley & Sons.
- Bitran, G. and S. Mondschein (1996), 'Mailing decisions in the catalog sales industry'. *Management Science* 42(9), 1364–1381.
- Blattberg, R. C. and J. Deighton (1996), 'Manage marketing by the customer equity test'. *Harvard Business Review* **74**(4), 136–144.
- Blattberg, R. C., G. Getz, and J. S. Thomas (2001), Customer Equity: Building and Managing Relationships as Valued Assets. Boston, Massachusetts: Harvard Business School Press.
- Bolton, R. N. (1998), 'A dynamic model of the duration of the customer's relationship with a continuous service provider: The role of satisfaction'. *Marketing Science* 17(1), 45–65.
- Bolton, R. N. and K. N. Lemon (1999), 'A dynamic model of customers' usage of services: Usage as an antecedent and consequence of satisfaction'. *Journal of Marketing Research* 36(2), 171–186.
- Breese, J. S., D. Heckerman, and C. Kadie (1998), 'Empirical analysis of predictive algorithms for collaborative filtering'. *Proceedings of the Fourteenth Conference on Uncertainty in Artificial Intelligence.*
- Brynjolfsson, E. and M. D. Smith (2000), 'Frictionless commerce? A comparison of internet and conventional retailers'. *Management Sci*ence 46(4), 563–585.

- Bult, J. R. and T. Wansbeek (1995), 'Optimal selection for direct mail'. Marketing Science 14(4), 378–394.
- Cao, Y. and T. S. Gruca (2005), 'Reducing adverse selection through customer relationship management'. *Journal of Marketing* **69**(4), 219–229.
- Chakravarti, D., A. Mitchell, and R. Staelin (1981), 'Judgmentbased marketing decision models: Problems and possible solutions/ commentary on "Judgment-Based Marketing Decision Models"'. *Journal of Marketing* 45(4), 13–40.
- Chen, Y. (1997), 'Paying customers to switch'. Journal of Economics and Management Strategy 6, 877–897.
- Chen, Y., C. Narasimhan, and Z. J. Zhang (2001), 'Individual marketing with imperfect targetability'. *Marketing Science* 20(1), 23–41.
- Chen, Y. and Z. J. Zhang (2001), 'Price-for-information effect and benefit of behavior-based targeted pricing'. *Working Paper*.
- Cox, D. R. (1975), 'Partial likelihood'. Biometrika 62, 269–276.
- Dekimpe, M. G. and D. M. Hanssens (1995), 'The persistence of marketing effects on sales'. *Marketing Science* 14(1), 1–21.
- Dekimpe, M. G. and D. M. Hanssens (1999), 'Sustained spending and persistent response: A new look at long-term marketing profitability'. *Jmr, Journal of Marketing Research* 36(4), 397–412.
- Dowling, G. R. and M. Uncles (1997), 'Do customer loyalty programs really work?'. *Sloan Management Review* **38**(4), 71–82.
- Drèze, X. and A. Bonfrer (2001), 'To pester or leave alone: Lifetime value maximization through optimal communication timing'. Working Paper. Wharton-SMU Research Center: .
- Drèze, X. and A. Bonfrer (2003), 'A renewable-resource approach to database valuation'. Working Paper. Wharton-SMU Research Center.
- Du, R. Y., W. A. Kamakura, and C. F. Mela (forthcoming), 'Size and share of customer wallet'. *Journal of Marketing*.
- Dwyer, F. R. (1997), 'Customer lifetime valuation to support marketing decision making'. Journal of Direct Marketing 11(4), 6–13.
- Enders, W. (1994), Applied Econometric Times Series. New York: John Wiley & Sons.

- Fader, P. S., B. G. S. Hardie, and K. L. Lee (2005a), "Counting your customers" the easy way: An alternative to the pareto/NBD model'. *Marketing Science* 24(2), 275–284.
- Fader, P. S., B. G. S. Hardie, and K. L. Lee (2005b), 'RFM and CLV: Using iso-value curves for customer base analysis'. *Journal of Marketing Research* XLII, 415–430.
- Fernández, P. (2001), 'Valuation of brands and intellectual capital'. Working Paper.
- Forrester (2001). Effective Email Marketing.
- Fournier, S., S. Dobscha, and D. G. Mick (1998), 'Preventing the premature death of relationship marketing'. *Harvard Business Review* 76(1), 42–44.
- Fudenberg, D. and J. Tirole (2000), 'Customer poaching and brand switching'. RAND Journal of Economics 31(4), 634–657.
- Garbarino, E. and M. S. Johnson (1999), 'The different roles of satisfaction, trust, and commitment in customer relationships'. *Journal* of Marketing **63**(2), 70–87.
- Gensch, D. (1973), Advertising Planning Mathematical Models in Advertising Media Planning. New York: Elsevier Scientific Publishing Company.
- Giuffrida, G., W. Chu, and D. M. Hanssens (2000), 'Mining classification rules from datasets with large number of many-valued attributes'. *Lecture Notes in Computer Science* 1777. Springler-Verlag, pp. 335–349.
- Greene, W. H. (2000), Econometric Analysis. Prentice Hall.
- Greyser, S. A. and H. P. Root (1999), 'Improving advertising budgeting'. MSI Working Paper Report No. 00-126.
- Gupta, S. (1988), 'Impact of sales promotions on when, what, and how much to buy'. *Journal of Marketing Research* **25**(4), 342–355.
- Gupta, S. and D. R. Lehman (2003), 'Customers as assets'. Journal of Intercative Marketing 17(1), 9–24.
- Gupta, S., D. R. Lehman, and J. A. Stuart (2002), 'Valuing customers'. Journal of Marketing Research XLI, 7–18.
- Gupta, S. and V. Zeithaml (forthcoming), 'Customer metrics and their impact on financial performance'. *Marketing Science*.

#### Full text available at: http://dx.doi.org/10.1561/170000002

- Gustafsson, A., M. D. Johnson, and I. Roos (2005), 'The effects of customer satisfaction, relationship commitment dimensions, and triggers on customer retention'. *Journal of Marketing* 69, 210–218.
- Hansotia, B. J. and P. Wang (1997), 'Analytical challenges in customer acquisition'. Journal of Direct Marketing 11(2), 7–19.
- Helsen, K. and D. C. Schmittlein (1993), 'Analyzing duration times in marketing: Evidence for the effectiveness of hazard rate models'. *Marketing Science* 11(4), 395–413.
- Hogan, J. E., D. R. Lehmann, M. Merino, R. K. Srivasta, J. S. Thomas, and P. C. Verhoef (2002a), 'Linking customer assets to financial performance'. *Journal of Service Research* 5(1), 36–38.
- Hogan, J. E., K. N. Lemon, and B. Libai (2002b), 'The true value of a lost customer'. MSI Working Paper Report No. 02-108.
- Hogan, J. E., K. N. Lemon, and R. R. Rust (2002c), 'Customer equity management: Charting new directions for the future of marketing'. *Journal of Service Research* 5(1), 4–12.
- Hotelling, H. (1929), 'Stability in competition'. The Economic Journal 39(153), 41–45.
- Jackson, B. B. (1985), Winning and Keeping Industrial Customers the Dynamics of Customer Relationships. Lexington, Mass: Lexington Books.
- Jackson, D. (1989a), 'Determining a customer's lifetime value'. Direct Marketing 51(11), 60-62, 123.
- Jackson, D. (1989b), 'Determining a customer's lifetime value (Part 2)'. Direct Marketing 52(1), 24–32.
- Jackson, D. (1989c), 'Insurance marketing: Determining a customer's lifetime value (Part 3)'. Direct Marketing 52(4), 28, 30.
- Jain, D. and S. Singh (2002), 'Customer lifetime value research in marketing: A review and future directions'. *Journal of Intercative Marketing* 16(2), 34–46.
- Jedidi, K., C. F. Mela, and S. Gupta (1999), 'Managing advertising and promotion for long-run profitability'. *Marketing Science* **18**(1), 1–22.
- Johnson, E. J., W. W. Moe, P. S. Fader, S. Bellman, and G. L. Lohse (2004), 'On the depth and dynamics of online search behavior'. *Management Science* 50(3), 299–308.

- Jones, T. O. and W. E. Jr. Sasser (1995), 'Why satisfied customers defect'. Harvard Business Review 73(6), 88–99.
- Kamakura, W., S. Ramaswami, and R. Srivasta (1991), 'Applying latent trait analysis in the evaluation of prospects for cross-selling of financial services'. *International Journal of Research in Marketing* 8, 329–349.
- Kamakura, W. A. and M. Wedel (2003), 'List augmentation with model based multiple imputation: A case study using a mixed-income factor model'. *Statistica Neerlandia* 57(1), 46–57.
- Kamakura, W. A., M. Wedel, F. d. Rosa, and J. A. Mazzon (2003), 'Cross-selling through database marketing: A mixed data factor analyzer for data augmentation and prediction'. *International Journal* of Research in Marketing 20, 45–65.
- Keane, T. J. and P. Wang (1995), 'Applications for the lifetime value model in modern newspaper publishing'. *Journal of Direct Marketing* 9(2), 59–66.
- Keil, S. K., D. Reibstein, and D. R. Wittink (2001), 'The impact of business objectives and the time horizon of performance evaluation on pricing behavior'. *International Journal of Research in Marketing* (18), 67–81.
- Kim, B.-D. and S.-O. Kim (1999), 'Measuring upselling potential of life insurance customers: Application of a stochastic frontier model'. *Journal of Interactive Marketing* 13(4), 2–9.
- Klemperer, P. (1987a), 'The competitiveness of markets with switching costs'. Rand Journal of Economics 18(1), 138–150.
- Klemperer, P. (1987b), 'Markets with consumer switching costs'. Quarterly Journal of Economics 102(2), 375–394.
- Knott, A., A. Hayes, and S. Neslin (2002), 'Next-product-to-buy models for cross-selling applications'. *Journal of Interactive Marketing* 16(3), 59–75.
- Kumar, V., N. K. Leman, and A. Parasuraman (2006), 'Managing customers for value: An overview and research agenda'. Journal of Service Research 9(2), 87–94.
- Labe R. P. Jr. (1994), 'Database marketing increases prospecting effectiveness at merrill lynch'. *Interfaces* 24(5), 1–12.

- Leeflang, P. S. H., D. R. Wittink, M. Wedel, and P. A. Naert (2000), Building Models for Marketing Decisions. Boston/Dordrecht/ London: Kluwer Academic Publishers.
- Lemmens, A. and C. Croux (2006), 'Bagging and boosting classification trees to predict churn'. Journal of Marketing Research 43(2), 276–286.
- Lemon, K. N., T. B. White, and R. S. Winer (2002), 'Dynamic customer relationship management: Incorporating future considerations into the service retention decision'. *Journal of Marketing* 66, 1–14.
- Leone, R. P., V. R. Rao, K. L. Keller, A. M. Luo, L. McAlister, and R. Srivasta (2006), 'Linking brand equity to customer equity'. *Journal* of Service Research 9(2), 125–138.
- Lewis, M. (2004), 'The influence of loyalty programs and short-term promotions on customer retention'. Journal of Marketing Research XLI, 281–292.
- Lewis, M. (2005a), 'A dynamic programming approach to customer relationship pricing'. *Management Science* **51**(6), 986–994.
- Lewis, M. (2005b), 'Incorporating strategic consumer behavior into customer valuation'. Journal of Marketing 69, 230–238.
- Lewis, M. (2006), 'Customer acquisition promotions and customer asset value'. Journal of Marketing Research XLIII(2), 195–203.
- Li, S., B. Sun, and R. T. Wilcox (2005), 'Cross-selling sequentially ordered products: An application to consumer banking services'. *Journal of Marketing Research* XLII, 233–239.
- Libai, B., D. Narayandas, and C. Humby (2002), 'Toward an individual customer profitability model: A segment-based approach'. *Journal of Service Research* 5(1), 69–76.
- Little, J. D. C. (1970), 'Models and managers: The concept of a decision calculus'. *Management Science* 16(8), B466–B485.
- Little, J. D. C. (1975), 'BRANDAID: A marketing-mix model'. Operations Research 23(4), 628–673.
- Little, J. D. C. and L. M. Lodish (1969), 'A media planning calculus'. Operations Research 17(1), 1–35.
- Little, J. D. C. and L. M. Lodish (1981), 'Judgment-based marketing decision models: Problems and possible solutions/commentary

on "Judgment-Based Marketing Decision Models". *Journal of Marketing* **45**(4), 13–40.

- Lodish, L. M. (1971), 'CALLPLAN: An interactive salesman's call planning system'. Management Science 18(4), 25–40.
- Malthouse, E. C. and R. C. Blattberg (2005), 'Can we predict customer lifetime value?'. Journal of Interactive Marketing **19**(1), 2–16.
- Manski, C. and S. Lerman (1977), 'The estimation of choice probabilities from choice-based samples'. *Econometrica* **45**, 1977–1988.
- Mantrala, M. K., P. Sinha, and A. A. Zoltners (1992), 'Impact of resource allocation rules on marketing investment-level decisions and profitability'. *Journal of Marketing Research* 29(2), 162–176.
- McGahan, A. M. and P. Ghemawat (1994), 'Competition to retain customers'. *Marketing Science* 13(2), 165–176.
- Mela, C. F., S. Gupta, and D. R. Lehmann (1997), 'The long-term impact of promotion and advertising on consumer brand choice'. *Journal of Marketing Research* 34(2), 248–261.
- Mittal, V. and W. A. Kamakura (2001), 'Satisfaction, repurchase intent, and repurchase behavior: Investigating the moderating effect of customer characteristics'. *Journal of Marketing Research* 37, 131–142.
- Montgomery, D. B., A. J. Silk, and C. J. Zaragoza (1971), 'A multipleproduct sales force allocation model'. *Management Science* 18(4), 3–24.
- Mulhern, F. J. (1999), 'Customer profitability analysis: Measurement, concentration, and research directions'. Journal of Interactive Marketing 13(1), 25–40.
- Narasimhan, C. (1988), 'Competitive promotional strategies'. Journal of Business 61(4), 427–449.
- Neslin, S., S. Gupta, W. Kamakura, J. Lu, and C. Mason (2006), 'Defection detection: Measuring and understanding the predictive accuracy of customer churn models'. *Journal of Marketing Research* 46(2), 204–211.
- Nijs, V. R., M. G. Dekimpe, J.-B. E. M. Steenkamp, and D. H. Hanssens (2001), 'The category-demand effects of price promotions'. *Marketing Science* 20(1), 1–22.
- O'Brien, L., and C. Jones (1995), 'Do rewards really create loyalty?'. Harvard Business Review 73(3), 75–82.

- Papatla, P. and L. Krishnamurthi (1996), 'Measuring the dynamic effects of promotions on brand choice'. *Journal of Marketing Research* 33(1), 20–35.
- Petrison, L. A., R. C. Blattberg, and P. Wang (1997), 'Database marketing – Past, present, and future'. Journal of Direct Marketing 11(4), 109–125.
- Pfeifer, P. E. and R. L. Carraway (2000), 'Modeling customer relationships as markov chains'. *Journal of Interactive Marketing* 14(2), 43–55.
- Pigou, A. C. (1920), *The Economics of Welfare*. London: Macmillan and co.
- Reichheld, F. F. (1993), 'Loyalty-based management'. Harvard Business Review 71(2), 64–73.
- Reichheld, F. F. (1996), 'Learning from customer defections'. Harvard Business Review 74(2), 56–61.
- Reichheld, F. F. and W. E. Sasser (1990), 'Zero defections: Quality comes to services'. *Harvard Business Review* 68(5), 105–111.
- Reichheld, F. F. and T. Teal (1996), The Loyalty Effect the Hidden Force Behind Growth, Profits, and Lasting Value. Boston, Mass: Harvard Business School Press.
- Reinartz, W. and V. Kumar (2002), 'The mismanagement of customer loyalty'. Harvard Business Review 80(7), 86–94.
- Reinartz, W. and V. Kumar (2003), 'The impact of customer relationship characteristics on profitable lifetime duration'. *Journal of Marketing* 67(1), 77–99.
- Reinartz, W., J. S. Thomas, and V. Kumar (2005), 'Balancing acquisition and retention resources to maximize customer profitability'. *Journal of Marketing* 69, 63–79.
- Reinartz, W. J. and V. Kumar (2000), 'On the profitability of long-life customers in a noncontractual setting: An empirical investigation and implications for marketing'. *Journal of Marketing* 64(4), 17–35.
- Resnick, P. and H. R. Varian (1997), 'Recommender systems'. Association for Computing Machinery. Communications of the ACM 40(3), 56–58.
- Rigby, D. K., F. F. Reichheld, and P. Schefter (2002), 'Avoid the four perils of CRM'. *Harvard Business Review*, February.

- Roberts, M. L. and P. D. Berger (1989), 'Direct Marketing Management'. Prentice Hall Collage Div.
- Rogers, E. M. (1983), Diffusion of Innovations. New York: Free Press.
- Rust, R. T. (1986), Advertising Media Models. Lexington Books.
- Rust, R. T., K. N. Lemon, and V. A. Zeithaml (2004), 'Return on marketing: Using customer equity to focus marketing strategy'. *Journal* of Marketing 68, 109–127.
- Rust, R. T. and P. C. Verhoef (2005), 'Optimizing the marketing interventions mix in intermediate-term CRM'. Marketing Science 24(3), 477–489.
- Rust, R. T., V. A. Zeithaml, and K. N. Lemon (2000), Driving Customer Equity How Customer Lifetime Value is Reshaping Corporate Strategy. New York: Free Press.
- Ryals, L. (2005), 'Making customer relationship management work: The measurement and profitable management of customer relationships'. *Journal of Marketing* 69, 252–261.
- Schmittlein, D. C., D. G. Morrison, and R. Colombo (1987), 'Counting your customers: Who are they and what will they do next?'. *Management Science* **33**(1), 1–24.
- Schmittlein, D. C. and R. A. Peterson (1994), 'Customer base analysis: An industrial purchase process application'. *Marketing Science* 13(1), 41–67.
- Shaffer, G. and Z. J. Zhang (1995), 'Competitive coupon targeting'. Marketing Science 14(4), 395–416.
- Shaffer, G. and Z. J. Zhang (2000), 'Pay to switch or pay to stay: Prefernce-based price discrimination in markets with switching costs'. Journal of Economics & Management Strategy 9(3), 397–424.
- Shaffer, G. and Z. J. Zhang (2002), 'Competitive one-to-one promotions'. Management Science 48(9), 1143–1160.
- Silk, A. J., L. R. Klein, and E. R. Berndt (1997), 'Intermedia substitutability in the U.S. national advertising market'. *Working Paper*.
- Simester, D. I., P. Sun, and J. N. Tsitsiklis (2006), 'Dynamic catalog mailing policies'. *Management Science* 52(5), 683–696.
- Sissors, J. Z. and E. R. Petray (1976), Advertising Media Planning. Chicago, IL: Crain Books.

- Stauss, B. and C. Friege (1999), 'Regaining service customers'. Journal of Service Research 1(4), 347–361.
- Thomas, J., R. Blattberg, and E. Fox (2004), 'Recapturing lost customers'. Journal of Marketing Research 38(2), 31–45.
- Thomas, J. S. (2001), 'A methodology for linking customer acquisition to customer retention'. *Journal of Marketing Research* **38**(2), 262–268.
- Tirole, J. (1988), The Theory of Industrial Organization. Cambridge, Mass: MIT Press.
- Venkatesan, R. and V. Kumar (2004), 'A customer lifetime value framework for customer selection and resource allocation strategy'. *Journal* of Marketing 68, 106–125.
- Verhoef, P. C. and B. Donkers (2001), 'Predicting customer potential value an application in the insurance industry'. *Decision Support* Systems 32, 189–199.
- Verhoef, P. C., P. H. Franses, and J. C. Hoekstra (2001), 'The impact of satisfaction and payment equity on cross-buying: A dynamic model for a multi-service provider'. *Journal of Retailing* 77, 359–378.
- Villanueva, J., P. Bhardwaj, Y. Chen, and S. Balasubramanian (2006a), 'Managing customer relationships: Should managers focus on the long term?'. Working Paper. University of California, Los Angeles.
- Villanueva, J., S. Yoo, and D. M. Hanssens (2006b), 'The impact of marketing-induced versus word-of-mouth customer acquisition on customer equity'. *Working Paper*.
- Villas-Boas, J. M. (1999), 'Dynamic competition with customer recognition'. RAND Journal of Economics 30(4), 604–631.
- Villas-Boas, J. M. (2004), 'Price cycles in markets with customer recognition'. RAND Journal of Economics 35(3), 486–501.
- Wiesel, T. and B. Skiera (2004), 'Enterprise valuation by using customer lifetime values'. *Working Paper*.
- Yoo, S. and D. M. Hanssens (2005), 'Modeling the sales and customer equity effects of the marketing mix'. *Working Paper*.
- Zauberman, G. (2003), 'The intertemporal dynamics of consumer lockin'. Journal of Consumer Research 30(3), 405–419.
- Zhang, J. and L. Krishnamurthi (2004), 'Customizing promotions in online stores'. *Marketing Science* 23(4), 561–578.