Journal of Business Research 76 (2017) 159–162

Contents lists available at ScienceDirect

Journal of Business Research

Editorial

The micro-foundations of pricing

Andreas Hinterhuber [a,*], Stephan M. Liozu [b]

Hinterhuber & Partners, Falkstrasse 16, 6020 Innsbruck, Austria
Case Western Reserve University, Weatherhead School of Management, 10900 Euclid Avenue, Cleveland, OH 44106, USA

ARTICLE INFO

Article history:
Received 20 October 2016
Received in revised form 6 November 2016
Accepted 30 November 2016
Available online 14 January 2017

Keywords:
Pricing
Individual characteristics
Individual behavior
Organizational performance
Rationality

ABSTRACT

In this editorial we define the core research questions that fall into the domain of this special issue: Research on the micro-foundations of pricing aims to explore how individual traits or individual activities influence pricing activities or performance at the organizational level. As current research and the papers in this special issue suggest, adopting a micro-level perspective is necessary to building better theories: Organizations do not act, individuals do. Understanding the complex causal relationships between individual traits and behaviors and organizational outcomes is of interest to both researchers and managers. It is our hope that this special issue on micro-foundations, on fallible and not easy to model traits, cognition, and decisions, advance the theory and practice of pricing.

1. What are micro-foundations?

Research on the micro level of organizational decision making has witnessed a surge in interest. In a dedicated special issue in the *Strategic Management Journal* (Powell, Lovallo, & Fox, 2011), Levinthal (2011) asks, "a behavioral approach to strategy—what's the alternative?" The *SMJ* Editors state, "strategic management theory lacks adequate psychological groundings" and that "until strategy theory builds stronger foundations in psychology, it will struggle to explain the facts of firm performance" (Powell et al., 2011, p. 1370). Recent developments in finance, organization theory, and strategic management have moved micro-level aspects of decision making solidly within mainstream research. The literature on pricing, however, has not yet dedicated attention to the examination of its micro-foundations, although pricing quite strongly influences company performance (Nagle & Holden, 2002). While arguably journals do publish studies examining aspects related to micro-foundations (Che-Ha, Mavondo, & Mohd-Said, 2014; Mousavi & Kheirandish, 2014; Raghubir, 2006), there is, as of today, no systematic research on the micro-foundations of pricing. This special issue can probably claim to be the first one dedicated exclusively to the micro-foundations of pricing. This exclusivity is not for lack of interest: a call in *Industrial Marketing Management* on "Psychological micro-foundations of business-to-business decision making" is open while this issue is going to press.

Research on the micro-foundations of organizational decision making is based on the following premises (Hodgson, 2012): "Organizations are made up of individuals, and there is no organization without individuals" (Felin & Foss, 2005, p. 441); "Nothing is more fundamental in setting our research agenda and informing our research methods than our view of the nature of the human beings whose behavior we are studying" (Simon, 1985, p. 303); "Strategic management should fundamentally be concerned about how intentional human action and interaction causally produce strategic phenomena" (Abell, Felin, & Foss, 2008, p. 492). The simple idea is "not only are individuals and ordinary activities important in conferring capabilities their uniqueness, but […] they are in some ways the only relevant things" (Salvato, 2009, p. 397).

Research on the micro-foundations of pricing seeks to understand how individual traits or individual activities influence organizational activities in the domain of pricing or organizational performance. The pricing domain includes determination of list prices, price-setting practices, price realization, price negotiations with customers, freedom to set prices/grant discounts to customers, price flexibility, price communication, value quantification, price perception, information processing on competitor prices, information processing on customers/customer needs, information processing on costs, incentive systems, bonus systems, headquarter support on pricing, CEO championing of pricing, and pricing capabilities.

The interest in the micro-foundations of pricing springs from the simple recognition that organizations do not act – individuals do. As scholars, however, we tend to attribute to organizations properties which only individuals can have. The literature speaks of "organizational capabilities" and describes organizations as "innovative"; however, organizations do not have capabilities, individuals do; organizations

* Corresponding author.
E-mail addresses: andreas@hinterhuber.com (A. Hinterhuber), sliozu@case.edu (S.M. Liozu).

http://dx.doi.org/10.1016/j.jbusres.2016.11.018
0148-2963/

are not innovative, individuals are. This special issue thus explores how individual characteristics and behaviors affect pricing activities or performance at the organizational level.

2. Micro-foundations in managerial practice

Research on micro-foundations is relevant for management practice and has public policy implications. Two salient examples: First, a current paper examines the factors that explain overall policy choices and the overall risk inclination of banks (Hagendorff, Saunders, Steffen, & Vallascas, 2016). This study finds that, contrary to expectations, remuneration explains only about 4% of bank behavior. Style, i.e. a banker's personality, talent, and work ethic, explains more than half of the variation in bank risk taking during the global financial crisis. Banker personalities seem to drive bank behavior much more than bonuses. This research thus suggests that a reduction in the risk-seeking behavior of banks could be achieved not by more regulation, but by a higher emphasis on individual traits in the process of personnel selection, promotion, and dismissal. Second, behavioral profiling to identify managerial talent is gaining prominence in companies such as McKinsey, Airbnb, LinkedIn, and Deutsche Bank. Dissatisfied with traditional methods – for example, tests, assessment centers, or academic results – of identifying future high potentials and of reducing turnover of new recruits, these and other companies make heavy use of behavioral profiling (Noonan, 2016). Management practice thus has a keen interest in understanding how individual characteristics influence decisions and performance at the organizational level.

3. The papers in this special issue

In total the call for papers for this special section generated 25 papers. Four submissions were desk-rejected. Of the remaining 21 papers seven papers were accepted after three rounds of revision on average. These seven papers all explore how individual traits or individual activities influence organizational activities or organizational performance. We briefly present these papers following the outline below (see Fig. 1).

One paper explores the link between individual-level activities and characteristics and organizational performance. "Value quantification capabilities in industrial markets," by Hinterhuber, explores the behaviors and traits that influence value quantification capabilities, that is, the sales manager abilities to convert competitive advantages into quantified, customer-specific monetary benefits. These behaviors and traits are risk taking and creativity, sales manager questioning style, customer-oriented selling, and cross-functional collaboration. This paper also documents a positive relationship between value quantification capabilities and firm performance. This paper, based on a survey of 131 US sales and account managers in industrial markets, thus contributes to the emerging stream of research on selling and value-based-selling capabilities.

The other six papers examine relationships between individual behaviors and traits and organizational activities, broadly defined. "The micro-foundations of pricing strategy in industrial markets: A case study in the European packaging industry," by Hallberg, examines the micro-foundations of industrial pricing strategy implementation. This paper, based on the analysis of 26 interviews in three European industrial companies, finds that the implementation of pricing strategies is severely constrained by individual-level traits and routines, specifically individual judgment, human capital, and commercial experience. Individuals, the study suggests, strongly matter in the context of pricing strategy implementation. This paper is thus part of a rich and emerging stream of literature that highlights the strategic nature of pricing: strategic, since it encompasses a resource and activity configuration that is valuable, rare, difficult to imitate, non-substitutable, and embedded in a firm's organization (Barney, 1991) and that thus enables the firm to build a competitive advantage and to achieve superior profitability as a result of pricing (Hinterhuber & Liozu, 2012).

The paper "Retailers' and manufacturers' price-promotion decisions: Intuitive or evidence-based?," by Bogomolova, Szabo, and Kennedy, examines how manufacturers and retailers make price-promotion decisions. This paper, based on 34 interviews with managers from European, US, and Australian companies, finds that the manufacturer and retailer decisions to use price promotions are driven heavily by habits and imitation, and much less by a deliberate analysis (e.g., goal setting, identification/evaluation of alternative courses of action, implementation, analysis of actual against expected results, learning and improvement). This paper thus highlights the need to understand much better the role of habits, intuition, or untested assumptions in the context of changing pricing practices. It is a further contribution to the frequently observed price rigidities in practice (Watson, Wood, & Fernie, 2015): habits are difficult to change, and research on how to do so successfully appears highly promising.

The paper "Purchase decision regret: Negative consequences of the steadily increasing discount strategy," by Gabler, Landers, and Reynolds, examines how individual characteristics influence buying propensities in the context of steadily increasing discount strategies. With this pricing strategy, customers have to balance the benefits of savings against the risk of missing out on a particular deal altogether. The study, based on a sample of non-student US consumers, finds that materialism and price consciousness both impact the decision to buy. This study also contributes to the fascinating debate between action bias and its opposite, the omission bias, that is, the preference for harm caused by omission over equal harm caused by action (Baron & Ritov, 2004). In this purchase situation, consumers seem to exhibit an action bias: inaction regret is stronger than action regret. This research thus contributes to the emerging literature on biases in the context of pricing decisions (Hinterhuber, 2015), an area that is bound to attract further research interest.

In "Presenting comparative price promotions vertically or horizontally: Does it matter?" Feng, Suri, Chao, and Koc examine whether differences in presentation of comparative price promotions affect price perceptions. This paper, based on a number of studies with non-student populations, suggests that presenting prices in price promotions vertically leads to faster and more accurate price computations. This paper also suggests that vertical price presentations rely more on visuospatial resources, whereas horizontal price representations rely more on verbal memory resources. This study also sheds light on consumer characteristics – math anxiety – that influence price perceptions. This paper clearly shows the need for more research highlighting the role of psychological traits in influencing price perceptions in both B2C and B2B.

The paper "Value-based pricing in competitive situations with the help of multi-product price response maps," by Dost and Geiger, proposes a method for eliciting empirical willingness-to-pay distributions for several products at the same time. By using individual willingness-to-pay ranges to build price response maps, this paper shows how to set profit- or revenue-maximizing prices for a portfolio of products. It suggests that the multi-product price response maps can be fruitful for a number of marketing and competitive simulations. Multi-product price response maps are thus important pricing tools that can facilitate the implementation of value-based pricing for product portfolios.

The paper "Barriers to implementing value-based pricing in industrial markets: A micro-foundations perspective," by Töytäri, Keränen, and Rajala, examines the micro-level activities that act as barriers to the implementation of value-based pricing. This paper, based on 24 interviews in a single company, identifies three categories of barriers that individuals face when implementing value-based pricing: individually induced, organizationally induced and externally induced barriers. Individually induced barriers: employee attitudes, experiences, and capabilities act as powerful forces inducing employees to stick to cost-based pricing, although employees in other parts of the company successfully implement value-based pricing. Organizationally induced barriers include company culture, processes, tools and customer selection mechanisms. Externally induced barriers include industry norms, the

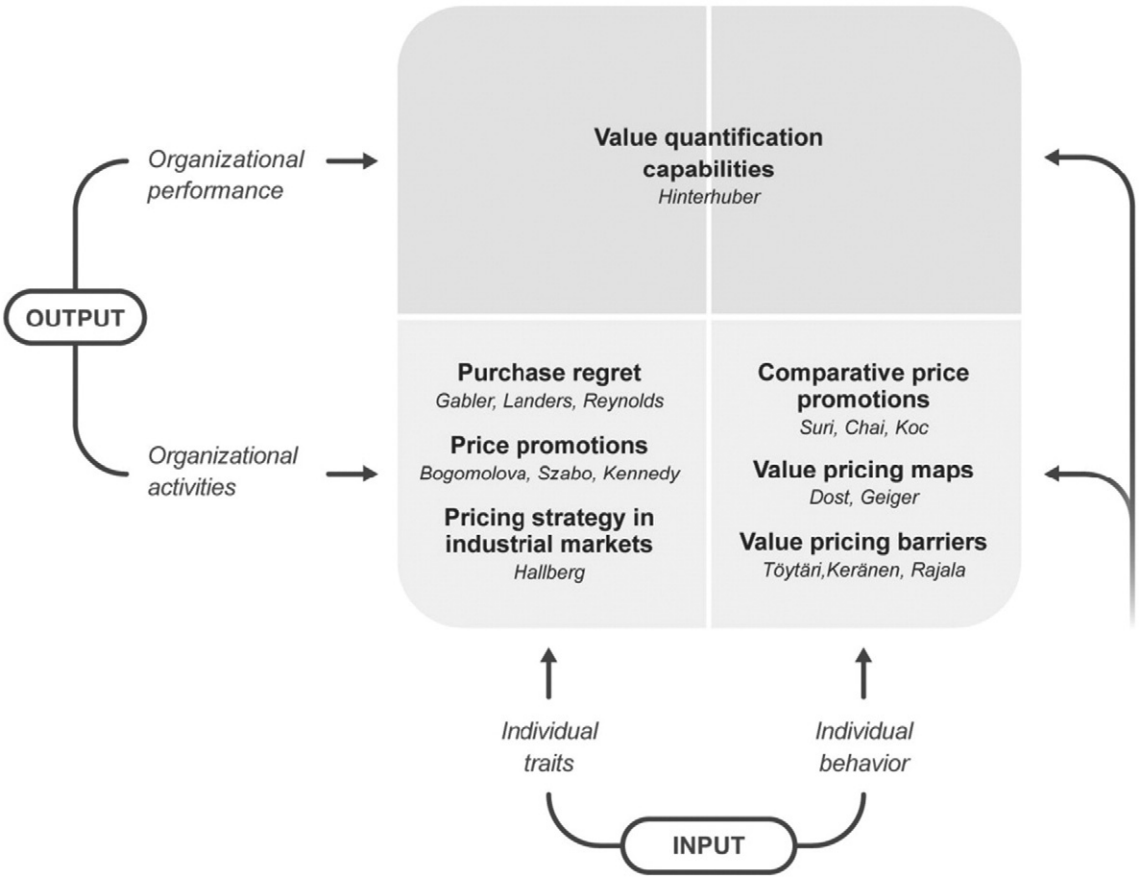


Fig. 1. The papers in this special issue.

maturity of the procurement function of customers, and the bargaining power of customers vis-a-vis their own downstream customers. By shedding light on the barriers at the individual level that prevent the implementation of value-based pricing, this paper also offers suggestions on their removal: sensemaking strategies can legitimize the implementation of value based pricing within organizations.

As all these papers tell, adopting a micro-foundational perspective is beneficial and helps to advance the theory and practice of pricing. Nevertheless, research on the micro-foundations of pricing is still in its infancy, and these papers barely scratch the surface of this rich and complex domain. We look forward to all future endeavors in this area.

Acknowledgments

Several individuals contributed substantially to bringing this special issue to fruition. First and foremost: Arch Woodside, JBR Editor, recognized the potential of a special issue on the micro-foundations of pricing and provided ongoing feedback and guidance during all stages of bringing this special issue to life. We are grateful for his leadership and trust. Second: the reviewers. Forty reviewers contributed, on balance, at least as much to this special issue as authors themselves. We thank them all for their patient, developmental and constructive feedback on the papers reviewed. More than one initially weak, but highly promising, paper appears here only because a reviewer recognized and helped shape its potential. Specifically, we sincerely thank (in alphabetical order): Michael J. Barone (University of Louisville), Catherine Cleophas (RWTH Aachen), Annie Cui (West Virginia University), Florian Dost (Europa Universität Viadrina), Hooman Estelami (Fordham University), Joel Evans (Hofstra University), Howard Forman (California State University, Fullerton), Colin Gabler (Ohio University), Karen Gedenk (Universität Hamburg), Niklas Hallberg (Lund University), Uta Herbst (Universität Potsdam), Margaret Hogg (Lancaster University), Peter Hultén (Umea University), Kostis Indounas (Athens University of Economics and Business), Paul Ingenbleek (Wageningen University), Joona Keränen (Lappeenranta University of Technology), Mario Kienzler (Linköping University), Ju-Young Kim (Karlsruhe Institute of Technology), Christian Kowalkowski (Linköping University and Hanken School of Economics), Richard Lancioni (Temple University), Wenjing Li (University of Kentucky), Ben Lowe (University of Kent), Vincent Mak (University of Cambridge), Mohammad Nejad (Fordham University), Mike Nicholson (Durham University), Petri Parvinen (Aalto University), Essi Pöyry (Aalto University), Risto Rajala (Aalto University), Abhik Roy (Quinnipiac University), Laura Marie Schons (Ruhr-Universität Bochum), Christina Sichtmann (Universität Wien), Martin Spann (Ludwig-Maximilians-Universität München), Pekka Töytäri (Aalto University), Jean-Pierre van der Rest (Leiden University), Marc Vanhuele (HEC Paris), Sylvia von Wallpach (Copenhagen Business School), Tuo Wang (Kent State University), Steve Wood (University of Surrey), Lan Xia (Bentley University), and Sarah Xiao (Durham University).

Third: we thank the authors for their contribution and patience. Patience, since we asked all authors of student-sample-based papers to replicate their studies with different samples, in light of the inherent problems of student samples (Peterson & Merunka, 2014). We trust that this request, to which all authors herein complied, increases the external validity of findings.

References

Abell, P., Felin, T., & Foss, N. (2008). Building micro-foundations for the routines, capabilities, and performance links. *Managerial and Decision Economics*, *29*(6), 489–502.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17*(1), 99–120.

Baron, J., & Ritov, I. (2004). Omission bias, individual differences, and normality. *Organizational Behavior and Human Decision Processes*, *94*(2), 74–85.

Che-Ha, N., Mavondo, F. T., & Mohd-Said, S. (2014). Performance or learning goal orientation: Implications for business performance. *Journal of Business Research*, *67*(1), 2811–2820.
Felin, T., & Foss, N. J. (2005). Strategic organization: A field in search of micro-foundations. *Strategic Organization*, *3*(4), 441–455.
Hagendorff, J., Saunders, A., Steffen, S., & Vallascas, F. (2016). The wolves of wall street - Managerial attributes and bank business models. *Working paper*. University of Cardiff: Cardiff Business School (available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2670525).
Hinterhuber, A. (2015). Violations of rational choice principles in pricing decisions. *Industrial Marketing Management*, *47*, 65–74.
Hinterhuber, A., & Liozu, S. M. (2012). Strategic B2B pricing. *Journal of Revenue & Pricing Management*, *11*(1), 1–3.
Hodgson, G. M. (2012). The mirage of microfoundations. *Journal of Management Studies*, *49*(8), 1389–1394.
Levinthal, D. A. (2011). A behavioral approach to strategy—What's the alternative? *Strategic Management Journal*, *32*(13), 1517–1523.
Mousavi, S., & Kheirandish, R. (2014). Behind and beyond a shared definition of ecological rationality: A functional view of heuristics. *Journal of Business Research*, *67*(8), 1780–1785.
Nagle, T. T., & Holden, R. K. (2002). *The strategy and tactics of pricing: A guide to profitable decision making* (3rd ed.). NJ: Prentice Hall Englewood Cliffs.
Noonan, L. (2016, 7 September). *Wall St turns to machines to find better-behaved bankers*. Financial Times.
Peterson, R. A., & Merunka, D. R. (2014). Convenience samples of college students and research reproducibility. *Journal of Business Research*, *67*(5), 1035–1041.
Powell, T. C., Lovallo, D., & Fox, C. R. (2011). Behavioral strategy. *Strategic Management Journal*, *32*(13), 1369–1386.
Raghubir, P. (2006). An information processing review of the subjective value of money and prices. *Journal of Business Research*, *59*(10), 1053–1062.
Salvato, C. (2009). Capabilities unveiled: The role of ordinary activities in the evolution of product development processes. *Organization Science*, *20*(2), 384–409.
Simon, H. A. (1985). Human nature in politics: The dialogue of psychology with political science. *American Political Science Review*, *79*, 293–304.
Watson, I., Wood, S., & Fernie, J. (2015). "Passivity": A model of grocery retail price decision-making practice. *European Journal of Marketing*, *49*(7/8), 1040–1066.

Journal of Business Research 76 (2017) 163–178

Contents lists available at ScienceDirect

Journal of Business Research

Value quantification capabilities in industrial markets

Andreas Hinterhuber

Hinterhuber & Partners, Falkstrasse 16, 6020 Innsbruck, Austria

ARTICLE INFO

Article history:
Received 19 November 2015
Received in revised form 8 September 2016
Accepted 6 November 2016
Available online 26 January 2017

Keywords:
Value quantification
Pricing
Firm performance
Sales
Psychological characteristics
Value-based pricing
Value-based selling

ABSTRACT

This study explores the origins and benefits of value quantification capabilities in industrial markets. After polling 131 US industrial sales and account managers, this study finds that value quantification capabilities improve firm—but not individual sales manager—performance. Second, in stable markets, the effect of value quantification capabilities on firm performance is stronger than in dynamic markets. Third, the study finds that the following psychological traits are positively related to the individual value quantification capability: risk taking and creativity, sales manager questioning style, customer-oriented selling, and cross-functional collaboration. This study suggests that value quantification capabilities benefit firm performance especially in stable markets, it explores attitudinal and behavioural traits underlying value quantification capabilities, and it highlights the need for further studies exploring the circumstances under which value quantification capabilities improve individual sales manager performance.

1. Introduction

What sets pricing in business markets apart? After all, the activities required for effective pricing in consumer markets—an analysis of customer needs, customer willingness to pay, competitive advantages, competitor price levels, and cost structures—are equally relevant for pricing in business markets. What is it that fundamentally distinguishes pricing in B2B from pricing in B2C?

The fundamental difference is this: in business markets, pricing is all about quantifying value, documenting that the price is less than the quantified sum of customer benefits. Anderson, Narus, and Van Rossum (2006, p. 96) observe: "To make customer value propositions persuasive, [B2B] suppliers must be able to demonstrate and document them." Value quantification is clearly not necessary in consumer markets: Coca Cola does not have to quantify to customers that its price premium over its main competitor—typically around 10%—is less than the incremental customer value provided. Individual consumers implicitly make this value quantification and then decide accordingly (i.e., purchase/no purchase).

In B2B, by contrast, purchasing managers quantify the value of alternative offers in their supplier selection decisions (Plank & Ferrin, 2002). In addition, these purchasing managers demand that B2B sellers themselves quantify value: A survey of 100 IT buyers at Fortune 1000 firms reveals that 81% of buyers expect vendors to quantify the financial value proposition of their solutions (Ernst & Young, 2002); a subsequent survey asks 600 IT buyers about major shortcomings in their suppliers' sales and marketing organizations (McMurchy, 2008): IT buyers consider an inability to quantify the value proposition and an inability to clarify its business impact as important supplier weaknesses. These surveys indicate that purchasing managers consider the ability to quantify the financial impact of the value proposition as very important in the vendor selection process. How well do sales managers quantify value? Both practitioner (Ernst & Young, 2002) and academic research (Anderson, Kumar, & Narus, 2007; Hinterhuber, 2008) suggest that most companies struggle to convert their value propositions into quantified customer benefits. There is thus a gap between the capabilities that industrial buyers demand and the capabilities that industrial sellers have regarding value quantification.

This gap raises a question: Does value quantification improve performance in industrial markets? Academic research suggests that it does; however, sparse evidence from practitioners appears, surprisingly, mixed. Qualitative research indicates that the performance of sellers in B2B—measured via realized price levels and win rates—improves as a result of value quantification (Anderson, Narus, & Narayandas, 2008; Töytäri, Brashear, Parvinen, Ollila, & Rosendahl, 2011). Practitioners are split on the question of whether value quantification is beneficial in B2B. On one side, companies such as SKF, SAP, HP, Grainger, Metso, Applied Industrial, Maersk and others recognize the benefits of value quantification. Tom Johnstone (2007), CEO of SKF, states: "One of the most important tasks we have today throughout the SKF Group is to create, deliver, and document the value that our products and solutions bring to our customers." Similarly, Matti Kähkönen (2012, p. 21), CEO of Metso, says: "Understanding of customers' businesses and KPIs [key performance indicators] create[s] a solid basis for quantifying the business impact for the customer."

E-mail address: andreas@hinterhuber.com.

http://dx.doi.org/10.1016/j.jbusres.2016.11.019
0148-2963/

Other industrial companies, such as Black & Decker, seem to take a different view: having lost its position as market share leader to Makita, the company regained the number one position in industrial power tools in the mid-1990s in one of marketing history's most spectacular turnarounds. A key element of Black & Decker's strategy, the launch of DeWalt in the professional power tool market, was an exclusive focus on product attributes, specifications, and features in marketing communication, thus leaving it to B2B customers themselves to understand and quantify value (Dolan, 1998). Communicating product benefits and value risked, according to Joe Galli, VP of marketing and sales, "consumerizing" an essentially industrial product (Dolan, 1996).

Contrasting views on the benefits of value quantification are evident also from the interviews underpinning this study. One interviewee (Hinterhuber & Heutger, 2017, p. 154) suggests that value quantification is always beneficial (see Section 3 for details):

> And even if you're not obliged to quantify the value to get the business, I would still advocate doing it. You can always go to the customer at a later date and say, "Hey! Look, this is what we did for you." This certainly helps to keep customers loyal and increase renewal rates …. I think it [i.e., value quantification] does always work.
> [Heutger, SVP Strategy and Marketing, DHL]

Another interviewee suggests that value quantification is not beneficial in highly commoditized markets (see Section 3 for the detailed quote). According to that interviewee, the benefits of value quantification are contingent on market characteristics.

Once again: Does value quantification always influence firm performance? And if so, under which circumstances are value quantification capabilities less beneficial? The existing literature does not appear to answers these fundamental questions. If value quantification indeed benefits firm performance, it should be clear what makes some sales managers more effective and others less so in value quantification. It is not. The purpose of the present study is to explore whether value quantification improves sales performance in B2B.

To answer these questions, this study surveys 131 US B2B sales and account managers to explore antecedents and consequences of value quantification. This study finds that value quantification capabilities are positively related to firm—but not to individual sales manager—performance. The data also suggest that this positive relationship is weaker in highly dynamic markets. Finally, this study identifies the psychological characteristics and behaviors at the level of the individual sales and account manager that are positively related to the value quantification capability. These characteristics are risk taking and creativity, sales manager questioning style, customer-oriented sales, and cross-functional collaboration. This study contributes to the understanding of the micro-foundations of value quantification capabilities at the level of individual sales managers and highlights the benefits of quantifying value in industrial markets. The study finally points towards the need to better understand the relationship between individual value quantification capabilities and individual performance.

2. Theoretical foundations

Three main research streams constitute the theoretical foundations of this paper: research on customer value, on selling, and on value-based pricing. Keränen and Jalkala (2013) and Terho, Haas, Eggert, and Ulaga (2012) provide thorough summaries of the literature on customer value: in line with earlier research equating value with customer benefits received (Zeithaml, 1988), scholars nowadays tend to conceptualize value in B2B as the incremental impact of a supplier's offer on the customer's own bottom line (Nagle & Holden, 2002). Value in business markets "is the worth in monetary terms of the economic, technical, service, and social benefits a customer firm receives in exchange for the price it pays for a market offering" (Anderson et al., 2008, p. 6). Customer value is the maximum amount that a customer is willing to pay to obtain the supplier's products and services. In B2B, customer value comes in two forms: quantitative customer benefits (i.e., cost reductions, margin improvements, risk reductions, capital savings) and qualitative customer benefits (e.g., intangible advantages). Value in B2B is subjective, customer-specific, relative to the customer's best alternative, discovered collaboratively with customers, and expressed in monetary terms.

Value and price are two separate constructs: changing one does not change the other (Hinterhuber, 2004; Wouters, 2010). The critical capability in industrial markets is value quantification or value visualization (Kindström, Kowalkowski, & Nordin, 2012): "Understanding customer value in business markets involves monetary quantification of the benefits of a firm's offering, yet, from the perspective of the customer firm" (Wouters, 2010, p. 1101). "A key to becoming part of customers' strategic agenda is the ability to quantify the business impact" (Storbacka, 2011, p. 706). Value quantification is necessary because customers, by themselves, generally fail to recognize value even when they see it: "One of the great misconceptions of quantitative pricing research is that customers who have been using a product know what it is worth to them without being told" (Nagle & Cressman, 2002, p. 33).

Value quantification is thus an important communication tool. Current research suggests that high-performing companies quantify and document value (Anderson et al., 2007; Anderson et al., 2008; Töytäri & Rajala, 2015), but so far this claim has not been substantiated by quantitative evidence. It is—in theory at least—possible that value quantification is an intellectually appealing idea where isolated cases of success studies mask the fact that for most companies the pursuit of this strategy substantially reduces performance, as is true for the popular concept of solution selling (Krishnamurthy, Johansson, & Schlissberg, 2003; Roegner & Gobbi, 2001). It is furthermore possible that the benefits of value quantification are contingent on firm-specific or environmental factors.

Research on selling has witnessed a surge of interest only recently. Traditionally, top marketing journals published a small and declining number of papers on sales management (Plouffe, Williams, & Wachner, 2008; Richards, Moncrief, & Marshall, 2010). This situation has changed: current research recognizes the importance of selling and finds that how selling is performed has a substantial impact on company performance (Haas, Snehota, & Corsaro, 2012). Among different approaches to selling that the literature discusses (Terho et al., 2012), value-based selling is most pertinent to the current study. Value-based selling comprises several overlapping steps: customer identification, customer needs analysis, value proposition development, value quantification, value-based pricing, post-delivery value verification and documentation, and development of case repositories (Terho et al., 2012; Töytäri & Rajala, 2015; Töytäri et al., 2011). Value quantification is a cornerstone and, at the same time, the "biggest challenge" of value-based selling (Töytäri & Rajala, 2015, p. 105). The literature examines the capabilities (Töytäri & Rajala, 2015) and performance implications of value-based selling (Terho, Eggert, Haas, & Ulaga, 2015). The factors that enable sales managers to quantify value, however, are yet to be fully explored.

The value quantification capability refers to the ability to translate a firm's competitive advantages into quantified, monetary customer benefits. The value quantification capability requires that the sales manager translates both quantitative customer benefits—revenue/gross margin increases, cost reductions, risk reductions, and capital expense savings—and qualitative customer benefits—such as ease of doing business, customer relationships, industry experience, brand value, emotional benefits or other process benefits—into one monetary value equating total customer benefits received. Value quantification demands more from sales managers than merely quantifying the total cost of ownership (Piscopo, Johnston, & Bellenger, 2008).

An important clarification concerns the relationship between value-based pricing and performance pricing. Value-based pricing refers to an ex-ante payment scheme where prices reflect customer willingness to

pay or expected customer profitability improvements (Nagle & Holden, 2002). Performance-based pricing approaches are arrangements where prices are adjusted ex post, as a function of predefined indicators of product or customer performance. Value-based and performance-based pricing are two separate constructs. The distinctive element is risk transfer. In value-based pricing, customers assume the full risk or benefit of performance variations. In performance-based pricing, risk is shared between the customer and the supplier. Fig. 1 illustrates the relationship between pricing approaches (cost-, competition-, and value-based) and payment (ex ante, ex post).

Industrial companies, such as Arcelor Mittal, DSM, GKN, Monsanto, Roche, SKF, Stanley Black & Decker, Würth, and many others set prices based on the incremental, expected performance advantages of their offerings to specific customers. These companies all set prices ex ante. In the steel industry, for example, prices reflect use value, which is determined by a range of factors including chemistry, mineralogy, and application (Ridsdale, 2011). Value-based pricing at DSM involves understanding customer-specific switching costs and perceived differentiation (Adade & Simonetti, 2013). There generally is no ex-post adjustment based on actual versus expected performance. In all these instances, value quantification is extremely important: it documents to customers that the price difference versus the customer's best available alternative is less than the incremental value delivered. Value is a promise that requires substantiation.

In performance-based pricing, prices are adjusted based on product performance or customer outcomes. Providers in a number of industries, including advertising, capital goods, child care, construction, defence contracting, education, healthcare, IT, management consultancy, logistics and transportation, social services, and outsourcing, employ variants of performance-based pricing. For a literature review, see Selviaridis and Wynstra (2015). Performance-based pricing is intuitively appealing since it appears to align interests. In healthcare, the environment where these arrangements have been studied better than in any other context, recent meta-analyses find that customer benefits in terms of improved quality are mixed and, where positive, moderate at best (Weibel, Rost, & Osterloh, 2010; Weissert & Frederick, 2013). Furthermore, evidence for improved cost effectiveness for customers is "lacking" (Eijkenaar, Emmert, Scheppach, & Schöffski, 2013, p. 124).

Performance-based pricing leads to cheating (Gravelle, Sutton, & Ma, 2010), gaming (Koning & Heinrich, 2013), adverse customer selection (Hendrickson, 2008), supplier focus on reaching performance thresholds (Hendrickson, 2008), the crowding out of intrinsic motivation (Weibel et al., 2010), perceived injustices due to weak links between efforts and results (Eijkenaar et al., 2013), and substantially increased transaction costs (Garrison et al., 2013). Data from industrial procurement suggest that performance-based contracting tends to favour suppliers at the detriment of customers under certain conditions (GAO, 2004).

In B2B, where frequently many suppliers work together to deliver value to customers, it may be practically impossible to dis-entangle the specific performance improvements attributable to one specific supplier and thus determine the specific performance incentive payable in case more than one supplier opts for performance-based pricing.

Value-based pricing usually does not imply performance-based pricing. Nagle, Hogan, and Zale (2011, p. 60) note: "In most cases, however, performance-based pricing [based on customer value] is simply impractical." Likewise, performance-based pricing does not imply value-based pricing: service-level agreements (SLAs), KPIs, and pay-for-performance incentives are routinely added to existing pricing mechanisms that are cost- and competition-based.

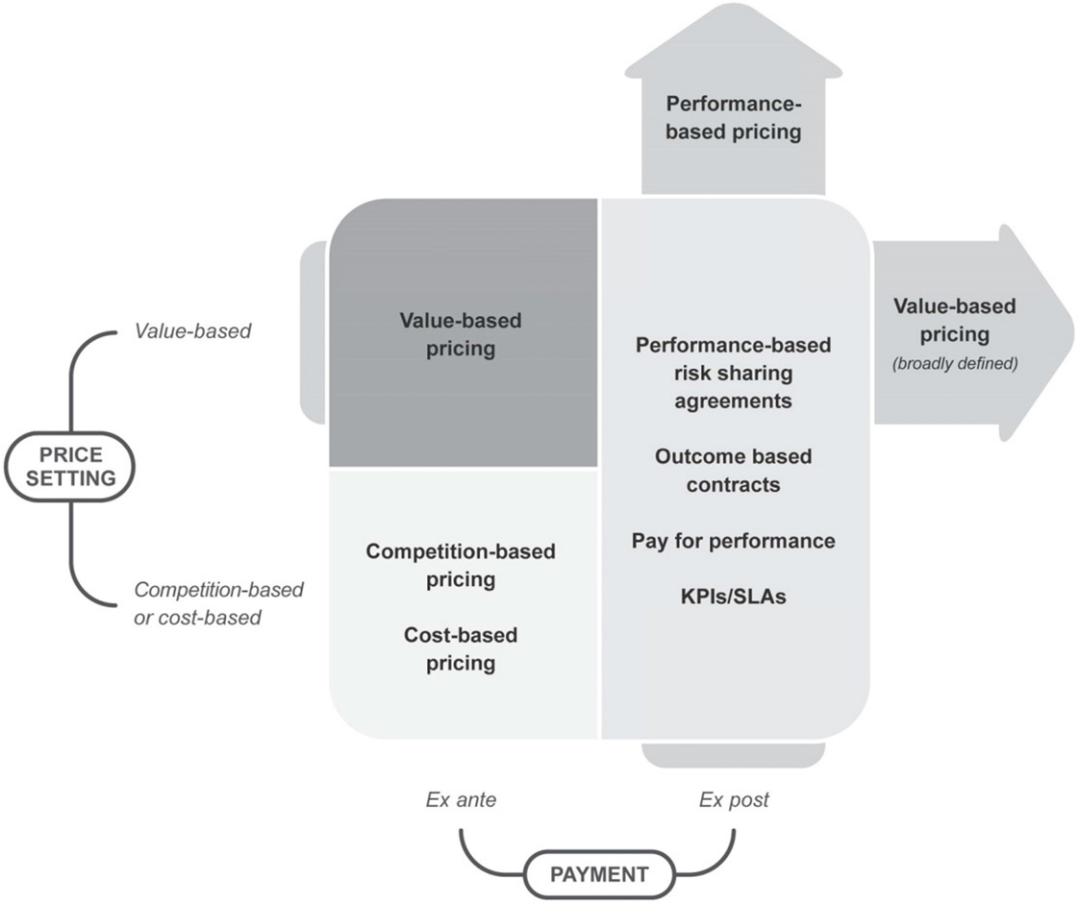


Fig. 1. Value-based pricing and performance pricing.

Two forms occur where value-based pricing and performance pricing intersect. Outcome-based contracting (Ng, Ding, & Yip, 2013) links payments to a set of indicators (Hünerberg & Hüttmann, 2003) that are potentially aligned with customer value: input-based contracts (e.g., linked to intensity of use) usually are not, but output-based contracts linked to performance levels (e.g., uptime) and output-based contracts linked to customer economics (e.g., cost savings) usually are. In performance-based risk-sharing agreements (the healthcare industry uses the term "value-based pricing"), suppliers participate in improvements in customer-defined outcomes (i.e., upside risk sharing), although they usually do not share the downside risk should customer economics deteriorate as a result of the transaction. True performance-based value-based pricing arrangements will require that suppliers share performance upsides and downsides, that is, that suppliers pay their customers for failing to meet defined outcomes. These cases are extremely rare.

For the reasons outlined, the adoption of performance-based risk-sharing agreements is slowing in healthcare in favour of simpler arrangements with ex ante pricing (Carlson, Gries, Yeung, Sullivan, & Garrison, 2014).

The current pricing literature thus seems to suggest the following. One: Performance-based pricing is a pseudo-intelligent solution to the misalignment between value and price in competition- or cost-based pricing. Two: Value quantification is especially important in the context of value-based pricing where it aligns buyer and seller interests without the numerous problems of performance-based pricing arrangements.

3. Hypotheses development

This study derives the key hypotheses from the literature. These findings are complemented with data from interviews: I select a very small sample of interviewees purposefully so that organizations that have well-developed capabilities in value quantification and, within these organizations, individuals that are heavily involved in quantifying and documenting value to customers, are represented (see Table 1). The sample is unrepresentative; nevertheless, these interviews provide a potentially interesting and complementary perspective to the findings from the literature. A transcription agency transcribes the interviews which I send back to interviewees for validation. The full interviews are published subsequently to this study in two edited book volumes (Hinterhuber & Heutger, 2017; Hinterhuber & Kemps, 2017; Hinterhuber & Snelgrove, 2016; Hinterhuber, Snelgrove, & Quancard, 2017).

3.1. Hypothesized research model

The question of whether core constructs in marketing—market or customer orientation—are psychological traits that shape behaviour or are behaviours that influence psychological traits has vexed the literature for decades (Donavan, Brown, & Mowen, 2004; Narver & Slater, 1998). Recent meta-analytic studies tend to lend more support to the idea that core marketing constructs such as market or customer orientation are observable manifestations of underlying cultural or psychological differences (Homburg & Pflesser, 2000; Zablah, Franke, Brown, & Bartholomew, 2012): a change in culture or psychological traits drives behavioural changes, not the other way around. This research leads to conceptualizing the value quantification capability as a construct that is influenced by underlying psychological traits.

Furthermore, well-executed case studies (Töytäri & Rajala, 2015; Töytäri et al., 2011) and anecdotal evidence in the managerial literature (Anderson et al., 2006; Anderson et al., 2007) suggest that value quantification capabilities increase firm and sales manager performance. The hypothesized research model therefore takes the form appearing in Fig. 2.

3.2. Antecedents of the value quantification capability

Value quantification requires sales managers to translate value—which is subjective, discovered collaboratively with customers, relative to the customer's best alternative, expressed in monetary terms, and based on a company's competitive advantage—into the customer's language. The literature and the interviews indicate that this translation requires particular skills and attitudes: unbiased listening skills, customer linking skills, ability to put client interests ahead of short-term sales targets, cross-functional collaboration within the firm, attitude towards asking meaningful questions that explore the business impact of solving customer problems, self-confidence, and an entrepreneurial attitude comfortable with risk seeking. Each of these points is discussed in detail below.

3.2.1. One: Active emphatic listening

Value quantification requires that sales managers capture dimensions of value that are salient to clients (Töytäri, Rajala, & Alejandro, 2015). Active emphatic listening skills (Drollinger & Comer, 2013; Pelham, 2010) are of paramount importance. Two interviewees (Hinterhuber, Snelgrove, & Quancard, 2017, p. 44; Hinterhuber & Snelgrove, 2016, p. 29) observe:

> [The most important capability for value quantification] is the ability to listen instead of the ability to push a product. Some lone wolves, some big sales people, will be terrible account managers because they do not listen. … Active listening is active only when you listen to things at very low noise levels: listening to some of the things the customer tells you that do not seem important, but are very important. So, when the plant manager out there was telling me, "Well, you know, I have a couple of 15-year-old transformers; they leak energy, but that is not a problem. They are not active." It is a problem. It's a lot of the customer's energy bill going down the drain, just like that.

> Listening to the low-noise things, capturing those things, is what we call active listening. Active listeners are a rare commodity, especially among salespeople. Salespeople are hunters, they jump at you, they don't listen. They want to sell, they want to push the product. So, active listening is number one.
>
> [Quancard, Former SVP and Head of Global Strategic Accounts, Schneider Electric]

> Another unintended learning [in the process of value quantification] came from the old adage we all should know, "listen to your customers": they can help you find even more value [in] your offering than you realize. Over the years I've improved our value quantification tool, by having customers challenge me on the benefits included and ask why something was not listed.
>
> [Snelgrove, Global VP Value, SKF]

Table 1
Profile of interviewees.

Name	Position	Company	Location	Interview length
Heutger	SVP Strategy and Marketing	DHL	Germany	38 min
Kemps	Global Sales Director	DHL	Belgium	60 min
Quancard	Former SVP and Head of Global Strategic Accounts	Schneider Electric	USA	48 min
Snelgrove	Global VP Value	SKF	Canada	9 pages (written Q&A)

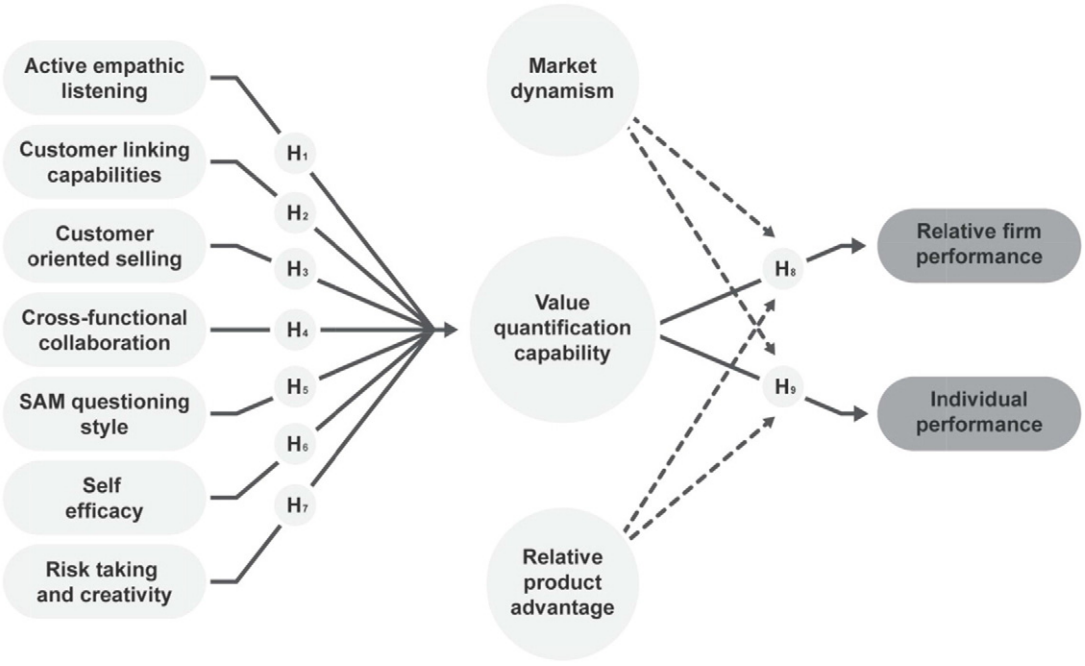


Fig. 2. Hypothesized research model.

3.2.2. Two: Customer linking capabilities

Value is always co-created with customers (Grönroos & Voima, 2013). Value quantification rests on the abilities to understand customer needs and to build appropriate relationships with customers (Hooley, Greenley, Cadogan, & Fahy, 2005). When asked about the most important personal characteristics required for effective value quantification, one interviewee comments (Hinterhuber & Kemps, 2017, p. 171):

> Crucial—and this is rule number one—is being aligned with the customer. You've got very transactional customers for whom you need somebody who's really good at project managing and sales pursuits, in order to be able to standardize and industrialize these responses. … So, to summarize, the number one point is that you need to align the right team with the customer's culture. Then you will be successful internally and externally.
>
> [Kemps, Global Sales Director, DHL]

3.2.3. Three: A genuine customer orientation

Value quantification requires that value be defined in accordance with the customer's best interests, even if doing so is harmful to short-term sales targets. The customer comes first, sales objectives second. Sales managers need to exhibit a customer-oriented approach to selling, as opposed to a hard selling tactic (Schwepker & Good, 2012). One interviewee comments (Hinterhuber & Kemps, 2017, p. 164):

> We have developed lots of packaging solutions now in automotive that are enabling us to really go in and say: "You should take this. We are not talking about the 4.5 million that your transport is going to cost, because you need 100 runs, we can tell you are only going to need 70 runs, it's not going to be 4.5 million, it's going to be 3.8 million." That's the type of discussion we can then have. [Selling less than what we could is] a sacrifice you have to make and it's not always an easy discussion.

When probed about whether he would care less about short-term revenue losses and more about building consultative or collaborative relationship with customers, this interviewee responds:

> Exactly. … You can either invest in always becoming cheaper and cheaper or you can invest in building up a meaningful relationship.
>
> [Kemps, Global Sales Director, DHL]

3.2.4. Four: Cross-functional collaboration

Pricing requires collaboration between different departments within the firm (Lancioni, 2005; Lancioni, Schau, & Smith, 2005). Quantified value propositions are integrating devices that synthesize dispersed knowledge and make it accessible for customers (Wouters & Kirchberger, 2015). Cross-functional collaboration is vital. One of the interviewees observes (Hinterhuber, Snelgrove, & Quancard, 2017, p. 45):

> [A key requirement for value creation and quantification] is the ability to collaborate with multi-stakeholders at the customer inside your own company. But again, pure salespeople are very often lone people. They're lone wolves, as we say. They don't collaborate. They're unable to motivate multifunctional teams. There's no value creation if you're by yourself—a lone wolf. Value creation is impossible. Value creation is common at the intersections. Value creation requires the ability to interpret weak signals. Value creation will come at the intersections of things, intersections of technology, intersections of the customer's issues, whatever they are. So, the ability to work with multi-stakeholders is the second key characteristic of a good value creator and a good value quantifier.
>
> [Quancard, Former SVP and Head of Global Strategic Accounts, Schneider Electric]

These considerations lead to the following set of hypotheses.

H1. The higher active emphatic listening skills, the higher the value quantification capability.

H2. The higher customer linking capabilities, the higher the value quantification capability.

H3. The higher customer-oriented selling skills, the higher the value quantification capability.

H4. The higher the cross-functional collaboration, the higher the value quantification capability.

3.2.5. Five: Value-based selling and value quantification depend on specific selling strategies that sales managers employ

Specifically, the hugely influential literature on SPIN selling – the acronym stands for situation, problem, implication and need-payoff questions – argues that the type of questions that industrial sales managers ask substantially affects sales closure rates (Rackham, 1988). At its core, Rackham argues that less effective sales managers predominantly ask questions exploring the customer's current situation and current problems. Highly effective sales managers, by contrast, additionally ask questions that explore the impact of customer problems on customer operations and, most importantly, the financial impact of solving customer problems on customer profitability or other key customer metrics.

Because implication and need-payoff questions are aimed at uncovering the financial benefits of solving customer problems, the effect of implication and need-payoff questions on the value quantification capability is expected to be stronger than the effect of situation and problem questions on this capability. The next set of thypotheses concerns the relationship between sales manager questioning style and the value quantification capability.

H5a. The higher the number of situation questions, the higher the value quantification capability.

H5b. The higher the number of problem questions, the higher the value quantification capability.

H5c. The higher the number of implication questions, the higher they value quantification capability.

H5d. The higher the number of need-payoff questions, the higher the value quantification capability.

3.2.6. Six: Self-confidence

Carlos Tavares, CEO of Peugeot, says: "The Peugeot 308 was the European Car of the Year in 2014. But the car was being discounted at a level that wasn't consistent with the quality of similar cars and compared with our German competitors. There was no reason we couldn't price higher. There was some lack of confidence in our capability" (Chow, 2015). Setting prices based on customer value requires confidence (Liozu, 2015). This holds also for value quantification. Thus the next hypothesis is:

H6. The higher the self-efficacy of the sales manager, the higher the value quantification capability.

3.2.7. Seven: Risk taking and creativity

Current research indicates that decision makers in industrial markets may favour cost-based over value-based pricing strategies since the former are perceived to involve less risk than the latter (Hunt & Forman, 2006). Value quantification requires a high tolerance for ambiguity and uncertainty: costs are objective, value is subjective. Buying and selling on value exposes both sellers and buyers to risk (Töytäri et al., 2015). The data from the interviews also suggest that a certain entrepreneurial orientation is beneficial in the context of value quantification. One interviewee observes (Hinterhuber & Heutger, 2017, p. 157):

> Sales managers need to be at least dynamic and interested in exploring new ideas, however you want to call it. It is… about being pro-active, being open and being dynamic or thinking about different ways of doing things.
>
> [Heutger, SVP Strategy and Marketing, DHL]

This is hypothesized formally as follows.

H7. The higher risk taking and creativity, the higher the sales manager value quantification capability.

In sum, the data at hand suggest that value quantification capabilities are a complex set of attitudes and skills that require sales managers to balance potentially opposing traits: the ability to put themselves in the shoes of customers to understand their emotions, motives, and cognitions (H1); trustworthiness to build meaningful relationships (H2); a willingness to put customer interests first and to forgo short-term revenue gains (H3); political savvy and cross-functional coordination skills (H4); business acumen and the ability to ask questions that explore meaningful dimensions of value (H5); self-confidence (H6); and a preference for risk and an entrepreneurial attitude (H7). Which of these traits is most relevant for value quantification is a question that the quantitative study is designed to answer.

3.3. Consequences of the value quantification capability

Sales managers quantify value for a reason—to drive performance. The next set of hypotheses is.

H8. There is a positive relationship between sales manager value quantification capability and relative firm performance.

H9. There is a positive relationship between sales manager value quantification capability and individual performance.

Do value quantification capabilities always improve performance? Current research (Ingenbleek, Debruyne, Frambach, & Verhallen, 2003; Ingenbleek, Frambach, & Verhallen, 2013) indicates that performance benefits are contingent on two factors: market dynamism and relative product advantage. The data at hand support this assertion. To the question "When does value quantification not work?" an interviewee (Hinterhuber, Snelgrove, & Quancard, 2017, p. 47) responds (see also Section 1):

> It might be when a product is very commoditized. It might be that competitors copy you very quickly. Whatever value you bring, in logistics or whatever—take the examples we discussed before [. .] it depends on how quickly your competitors catch up. If your competitors catch up very quickly, then it's really, really difficult.

> I would look at it more from a competitive standpoint than from an industry perspective alone. I do not believe there is a specific industrial sector. So, I think the lack of value quantification is about the competitive environment more than anything else.
>
> [Quancard, Former SVP and Head of Global Strategic Accounts, Schneider Electric]

The next set of hypotheses is therefore as follows.

H8a. Market dynamism negatively moderates the relationship between value quantification capability and relative firm performance such that, for high competitive intensity, the relationship is weaker than for low competitive intensity.

H8b. Market dynamism negatively moderates the relationship between value quantification capability and individual sales manager performance such that, for high market dynamism, the relationship is weaker than for low market dynamism.

H9a. Product advantage positively moderates the relationship between value quantification capability and relative firm performance such that, for high product advantage, the relationship is stronger than for low product advantage.

H9b. Product advantage positively moderates the relationship between value quantification capability and individual sales manager performance such that, for high product advantage, the relationship is stronger than for low product advantage.

4. Methods

4.1. Data collection and sampling

The dataset consists of an e-mail list of US sales and account managers purchased from a commercial database provider. Respondents are contacted in three waves starting in January 2014. From 2904 recipients I receive 246 partially or fully completed questionnaires for a response rate of 8%—similar to the response rate for other B2B pricing studies (Homburg, Allmann, & Klarmann, 2014; Liozu, 2015).

To ensure exclusive participation of B2B sales and account managers, I build in a filter question asking respondents to confirm their job titles (i.e., sales manager/account manager) and a filter question asking respondents about the main line of business of their companies (B2B/B2C). After eliminating incomplete responses or responses from unqualified candidates, I retain 131 questionnaires from B2B sales or account managers for final analysis. Table 2 provides the descriptive information for the sample: Respondent companies are typically industrial manufacturing firms that are privately owned, headquartered in the US with >500 employees.

Table 2
Descriptive statistics.

	n	%
Company type		
Manufacturing firm	76	58.5
Service organization	42	32.3
Distribution/retail company	12	9.2
Company ownership		
Publicly-traded	46	35.4
Privately-owned	79	60.8
Both	5	3.8
Company size (no. employees)		
<500	63	48.5
501 to 1000	12	9.2
1001 to 10,000	24	18.5
10,001 to 100,000	18	13.8
Over 100,001	13	10.0
Education background		
Marketing and sales	61	46.9
Finance and accounting	5	3.8
Technical, industrial and engineering	33	25.4
None of the above	31	23.8
Company location		
North America	103	79.2
Europe	19	14.6
Asia/Pacific	7	5.4
Middle East/Africa	1	0.8
Job title		
Sales manager	55	42.3
Account manager	30	23.1
Head of Sales, Director of Sales, Sales VP, SVP Sales	39	30.0
Head of Account Management, Director of Account Management	6	4.6

4.2. Measure development and assessment

I take all scales from the current literature and develop a new scale to measure the value quantification capability. I assess content and face validity through a full review of the literature to ensure that measurement items cover the domain of the constructs (Churchill, 1979; Nunnally, 1978). Measures, items, and sources are in Appendix A.

4.2.1. Independent variables

4.2.1.1. Active emphatic listening. Active emphatic listening is based on a multi-dimensional approach to listening that involves sensing, processing, and responding to customer words, ideas, feelings, and positions. The five-item scale is from Drollinger and Comer (2013).

4.2.1.2. Customer linking capabilities. Customer linking capabilities are among the most important market-based resources of any organization (Day, 1994). They include the ability to identify customer needs together with the capabilities to build effective customer relationships. The five-item scale is from Hooley et al. (2005).

4.2.1.3. Customer-oriented selling. The selling-orientation customer-orientation (SOCO) scale measures the customer orientation of sales managers at the individual customer level. The construct measures sales managers' desire to help customers, assess their specific needs, offer satisfactory products, and adequately describe their products, as well as sales managers' reluctance to engage in deceptive or hard selling practices (Periatt, LeMay, & Chakrabarty, 2004). The 10-item scale is from Periatt et al. (2004).

4.2.1.4. Cross-functional collaboration. Cross-functional collaboration measures inter-functional collaboration between sales and other departments, such as marketing, management, and sales support. The seven-item scale is from Rodriguez and Honeycutt (2011).

4.2.1.5. Sales manager questioning style. The scale is new and based on the SPIN selling questions (Rackham, 1988). The extent of engagement with each of the four different questioning styles is measured with four single-item measures, anchored at “does not apply” and “fully applies.” The use of a single-item scale to measure each of these different questioning styles is warranted in this case (Bergkvist & Rossiter, 2007; Sackett & Larson, 1990).

4.2.1.6. Self-efficacy. The self-efficacy scale measures confidence. Self-efficacy is positively related to challenging personal goals and job performance (Brown, Jones, & Leigh, 2005). Self-efficacy refers to individuals' beliefs that they possess the skills and resources necessary to succeed at a given task. The six-item scale is from Jones (1986).

4.2.1.7. Risk taking and creativity. This risk-taking and creativity scale measures willingness to take risks, willingness to try new ideas, creativity, and entrepreneurial orientation at the individual level. The four-item scale is from Wang, Tsui, and Xin (2011).

4.2.1.8. Value quantification capability. Since there is no empirical precedent to measure the value quantification capability, I develop a multiple-item scale. The construct measures the ability of the sales manager to translate product or service features into quantified customer value where customer value has both a quantitative (financial) and a qualitative (intangible) component. The scale has six items.

4.2.2. Moderators

4.2.2.1. Market dynamism. The market dynamism scale measures the speed of change in the external competitive environment. The five-item scale is adapted from Homburg and Pflesser (2000).

4.2.2.2. Relative product advantage. The relative product advantage scale measures product differentiation vis-à-vis competitors. This four-item scale is from Gatignon and Xuereb (1997).

4.2.3. Dependent variables

4.2.3.1. Firm relative performance. This scale measures the perceived firm performance relative to key competitors. This is thus a subjective evaluation of firm performance. The decision to use relative firm performance is warranted in samples that have a potentially high number of small and medium-sized companies where objective performance indicators frequently are distorted (Sapienza, Smith, & Gannon, 1988; Simsek, 2007; Simsek, Veiga, Lubatkin, & Dino, 2005). Subjective performance measurement is reliable (Kumar, Jones, Venkatesan, & Leone, 2011). This three-item scale is adapted from Morgan, Vorhies, and Mason (2009).

4.2.3.2. Individual performance. The sales manager individual performance scale measures the sales volume and price levels achieved at the individual level relative to a colleague operating in a similar position. This two-item scale is adapted from Piercy, Cravens, and Lane (2001).

4.3. Non-response bias

In order to evaluate any potential response bias, I categorize participants into two groups: those completing the survey within 2 weeks ($n = 59$; 24%) and those completing after ($n = 187$; 76%). Due to discrepancies in group size, potential differences in outcome by response date are tested using non-parametric Mann-Whitney *U* tests. There are no significant differences across any items, $ps > 0.05$, suggesting that individuals' responses do not appear to be impacted by early versus late responses.

5. Results

To evaluate the theorized models examining the link between individual factors on value quantification capability and the impact of value quantification on performance measures, I utilize partial least square structural equation modeling (PLS-SEM) with SmartPLS v.3.2. I choose PLS-SEM instead of traditional, covariance-based SEM (CB-SEM) for two main reasons. First, thanks to fewer data restrictions and higher model flexibility, PLS is preferable for exploratory research where measures are not yet fully established (Echambadi, Campbell, & Agarwal, 2006). Second, PLS-SEM models are more robust than CB-SEM at examining complex relationships between latent variables with relatively small sample sizes (Anderson & Gerbing, 1988; Hair, Sarstedt, Ringle, & Mena, 2012).

In PLS-SEM, path coefficients indicate the absolute magnitude of direct and indirect effects between latent constructs. Path coefficients are interpreted as follows: |~0.10| indicates a small effect, |~0.30| indicates a moderate effect, and |>0.50| indicates a large effect.

Model evaluation occurs in three stages. The first stage of analysis consists in assessing the measurement quality and ensuring appropriate psychometric properties of the items chosen. Next, the relative weights are calculated using a path weighting scheme and a maximum of 300 iterations. Significance of these paths is assessed by bootstrapping of 500 samples with no sign changes. Weak and non-significant paths are removed to increase the parsimony of the final model. Of note, PLS-based approaches to SEM do not evaluate goodness of fit of the model in a way analogous to CB-SEM; rather, the evaluation of the quality of the model is assessed through examination of paths, significance, and the measurement quality. Effect size and magnitudes of the final model are assessed through the path coefficients as well as the observed R^2 values.

5.1. Measurement model quality assessment

Prior to testing the theorized model, I examine the measurement model: Table 2 provides an overview of the full and modified measurement model. Following initial investigation of the measurement model, I remove items and constructs with weak and/or non-significant outer loadings to improve the overall quality of the measurement model. This step leads to the removal of the following latent constructs: active empathetic listening, customer linking capabilities, and self-efficacy. Additionally, due to high multicollinearity between individual performance items, I test the measurement model using each indicator separately; however, this construct is not significantly related to any of the remaining constructs in the model and is, as such, removed from the model (see Table 3).

Following removal of poorly performing items and constructs, I find that the outer loadings across latent variables are significant or approaching significance (e.g., $p < 0.10$). While some weak outer loadings are observed, these items are retained in the model for theoretically driven reasons to ensure that these important facets can be accounted for in the structural model. Additionally, there are some outer loadings that exceed the typical constraint value of 1.00, which may indicate some degree of multicollinearity between indicators of the same latent constructs; however, examination of other metrics (e.g., average variance extracted [AVE], reliability indices) suggests that this is not problematic for the factor structure and, as such, outer loadings >1 are retained in the measurement model.

Additionally, the AVE, composite reliability (CR), and internal consistency (Cronbach's α) are evaluated based on the recommendations in the current literature (Fornell & Larcker, 1981; Nunally & Bernstein, 1994). Table 4 provides the data.

Observed AVE values for customer-oriented selling and sales manager questioning style are above the desired minimum cut-off value of 0.500 for AVEs. Cross-functional collaboration and risk taking/creativity are below the desired cut-off; however, these are retained in the model as reliability measures, and outer loadings are within the acceptable range.

Composite reliabilities of all latent constructs are all well above the minimum cut-off of 0.60 (Fornell & Larcker, 1981). Additionally, internal consistency, expressed as Cronbach's alpha, of all latent constructs is in the acceptable to excellent range, αs ranging from 0.666 (questioning style) to 0.832 (customer-oriented selling).

Last, I examine discriminant validity by evaluating the correlations between latent constructs, which indicates that all correlations are below the critical threshold of 0.85, demonstrating that there does not appear to be redundancy in the indicators and the overall model.

5.2. Structural model

To create the most parsimonious model, I remove non-significant paths and non-meaningful latent constructs. The final structural model is in Fig. 3.

Cross-functional collaboration, customer-oriented selling, sales manager questioning style, and risk taking and creativity are all significantly and positively associated with the value quantification capability and account for over 20% of the total variance explained ($R^2 = 0.209$). Risk taking and creativity is the strongest indicator of value quantification capability (0.23), followed by questioning style (0.23), customer-oriented selling (0.17), and cross-functional collaboration (0.16).

On questioning style: All questions collectively are significantly associated with value quantification, evidenced by significant path leadings in the full measurement model tested. Asking questions about the payoff of a solution has the strongest weight in overall questioning latent scores, followed by asking about consequences, and asking about customer's problems, difficulties, and dissatisfactions; asking about the current situation has the lowest weight on overall scores.

Table 3
Outer loadings of measurement model.

Latent construct and item	Full measurement model		Modified measurement model	
	Loading	Sig.	Loading	
Active empathic listening				
I listen for more than just the spoken words	0.598		–	
I assure my customers that I am receptive to their ideas	0.461		–	
I ask questions that show my understanding of my customers' position	0.479		–	
I show my customers that I am listening by my body language	0.598		–	
I understand why my customers feel the way they do	0.507		–	
Customer linking capabilities				
Ability to provide superior levels of customer service and support	1.216		–	
Quality of relationships with key target customers	0.823		–	
Ability to understand customer needs and requirements	0.945		–	
Ability to create relationships with customers	0.804		–	
Ability to maintain and improve relationships with customers	0.933		–	
Customer-oriented selling				
I try to get customers to discuss their needs with me	−0.039		–	
A good salesperson has to have the customer's best interests in mind	0.087		–	
I try to bring a customer with a problem together with a product that helps solve that problem	0.003		–	
I offer the product of mine that is best suited to the customer's problem	−0.113		–	
I try to find out what kind of product would be most helpful to a customer	−0.081		–	
I try to sell as much as I can rather than satisfy a customer†	0.648		0.571	*
It is necessary to stretch the truth in describing a product to a customer†	0.953		0.689	*
I try to sell a customer all I can convince him/her to buy even if I think it is more than a wise person would buy†	0.844		0.674	*
I paint too rosy a picture of my product, to make them appear as good as possible†	1.431		1.546	*
I decide what products to offer on the basis of what products I can convince customers to buy, not on the basis of what will satisfy them in the long run†	0.800		0.507	*
Cross functional Collaboration				
I rely on my peers from other departments in order to meet my customers' needs	0.397		−0.129	m
I communicate with my colleagues on proposed solutions for my clients	0.545	*	0.440	m
I consistently share client information with others in the company	0.957	*	0.851	m
Communicating client needs is important in winning business	0.406	*	0.432	*
Communicating client needs is important for client retention	0.486	*	0.458	*
Communicating client needs is important in achieving customer satisfaction	0.412	*	0.409	m
I communicate with my sales manager regarding potential sales opportunities	0.718	*	0.691	m
SAM questioning				
I spend a lot of time asking questions about the customer's current situation (e.g. "Who are your main competitors?" "From whom else to you buy similar products to our own products?")	0.724	*	0.383	
I spend a lot of time asking questions about the customer's problems, difficulties, or dissatisfactions (e.g. "What prevents you from achieving higher quality?")	0.799	*	0.752	*
I spend a lot of time asking questions about the consequences of the customer's problems on her/his operations (e.g. "What effect does this problem have on output?")	0.654	*	0.788	*
I spend a lot of time asking questions about the payoff of a possible solution on the customer's operations (e.g. "If we did XXX, how much would you save?")	1.223	*	1.003	*
Self-efficacy				
My job is well within the scope of my abilities	−0.362		–	
I feel I am overqualified for the job I am doing	−0.657		–	
I feel confident that my skills and abilities equal or exceed those of my colleagues	−0.905		–	
My past experiences and accomplishments increase my confidence that I will be able to perform successfully in this organization	−0.471		–	
I could have handled a more challenging job	−0.717		–	
Professionally speaking, my new job exactly satisfies my expectations of myself†	0.527		–	
Risk taking				
I am willing to take risks	0.264	*	0.285	m
I am willing to try new projects and ideas	0.335	*	0.348	m
I have a rich entrepreneurial spirit	0.598	*	0.637	m
I am creative	0.885	*	0.865	m
Value quantification©				
Perform total cost of ownership (TCO) calculations versus key competitive offerings	1.196	*	1.290	*
Use factual data to demonstrate that the value of our products and services is higher than your price	1.180	*	1.290	*
Justify the price premium of your products/services over competing offers via a documentation and quantification of the incremental value to customers	1.074	*	0.977	*
Quantify how much also intangible benefits (e.g. better reputation) could be worth to customers	−0.619		–	
Translate performance differences between competitive products in monetary terms ($ or €)	1.333	*	1.230	*
Use value calculators or other value quantification tools	1.266	*	0.797	*
Relative product advantage				
Uniqueness	1.466	*	–	
Product/service quality	1.169	*	–	
Differentiation	1.536	*	–	
Overall performance	1.238	*	–	
Market dynamism				
New competitive entries	1.206	*	0.767	*
Changes in products offered by competitors	1.337	*	0.398	*

(continued on next page)

Table 3 (*continued*)

Latent construct and item	Full measurement model		Modified measurement model	
	Loading	Sig.	Loading	
Changes in competitor pricing strategies/tactics	1.322	*	1.310	*
Changes in sales advertising strategies of competitors	1.545	*	1.509	*
Changes in distribution strategies of competitors	1.504	*	0.823	*
Individual performance				
Your sales volume in the past year	–		–	
The average price level of your deals in the past year	–		–	
Relative firm performance[φ]				
Sales growth versus last year	0.856	*	1.053	*
Absolute operating profitability (EBIT/sales)	1.080	*	0.668	*
Growth in operating profitability (EBIT/sales)	1.083	*	0.797	*

[†] Item reverse coded.
[*] $p < 0.05$.
[m] $p < 0.10$.
[φ] Formative construct.

Furthermore, there is a significant, positive relationship between the value quantification capability and relative firm performance. Value quantification capabilities account for 12.3% of the variance in relative firm performance. The relationship between value quantification capability and individual performance is not significant. However, this relationship cannot be fully tested in the final structural model.

Testing for moderators leads to the following: There is no interaction effect of relative product advantage and value quantification capability on relative firm performance. Relative product advantage is also not significantly associated with relative firm performance. Therefore, I remove relative product advantage from the model. There is, however, a significant direct effect of market dynamism on relative firm performance. There is also a significant moderating effect of market dynamism on the relationship between value quantification capability and relative firm performance (−0.30), suggesting that when the competitive intensity increases the impact of value quantification capability on relative firm performance decreases. Table 5 provides the details.

6. Discussion

"Customer value is B2B marketing's defining preoccupation" (Wiersema, 2013, p. 484): the Marketing Science Institute (Marketing Science Institute, 2010, 2014) and the Institute for the Study of Business Markets (ISBM, 2012) both highlight value quantification as a key research priority. This study addresses this fundamentally important research question and advances what is known about the origins and benefits of value quantification capabilities in industrial markets. After polling 131 US sales and account managers in B2B, this study offers the following four substantial contributions.

First, value quantification capabilities substantially and positively influence firm performance—always. This finding, based on quantitative research, thus corroborates data from qualitative research (Töytäri & Rajala, 2015) and the managerial literature (Anderson et al., 2006) that value quantification is beneficial. Companies are thus well advised to invest in and nurture value quantification capabilities. These capabilities enable sales and account managers to translate competitive advantages into quantified customer benefits. Value quantification requires that sales managers go beyond quantifying merely total cost of ownership to customers. Value is multi-dimensional: value quantification requires the ability to translate the full spectrum of benefits into one figure representing the economic value that customers receive. The construct validity of the new scale, value quantification capability, appears reasonably satisfactory. However, while prior research and the literature suggest that this capability includes the ability to quantify the value of intangible benefits (i.e., qualitative elements), the current data show no such relationship. Further research may be needed to understand the role of qualitative benefits in value quantification.

Second, the positive impact of value quantification capabilities on firm performance increases under conditions of low market dynamism. In highly volatile markets, value quantification capabilities have a positive, albeit weaker impact on firm performance. Value quantification is highly beneficial when markets are stable. This finding thus extends current research findings: in highly dynamic markets, value quantification still contributes positively to overall firm performance, but less so than in stable markets. In place of value quantification capabilities, there are other capabilities that influence firm performance in highly dynamic markets which future studies should attempt to identify. This study thus resolves the tension that the mixed evidence from practitioners cited in Section 1 as well as the conflicting data from the interviews produced: the benefits of value quantification depend on market characteristics.

Third, the value quantification capability has no positive effect on individual sales manager performance. At first sight, this finding seems counterintuitive. However, the data from the interviews indicate that

Table 4
Final measurement model quality evaluation.

		AVE	CR	α	1	2	3	4	5	6
1	Cross functional collaboration	0.282	0.664	0.758						
2	Customer-oriented selling	0.780	0.935	0.832	−0.066					
3	Market dynamism	–	–	–	−0.041	0.167				
4	Relative firm performance	–	–	–	0.030	0.086	0.371			
5	Risk Taking and Creativity	0.339	0.633	0.720	0.147	0.023	0.069	0.187		
6	Sales manager questioning style	0.698	0.890	0.666	0.319	−0.135	−0.026	0.095	0.118	
7	Value quantification	–	–	–	0.259	0.131	0.121	0.214	0.319	0.289

Note. AVE = average variance extracted; CR = composite reliability.

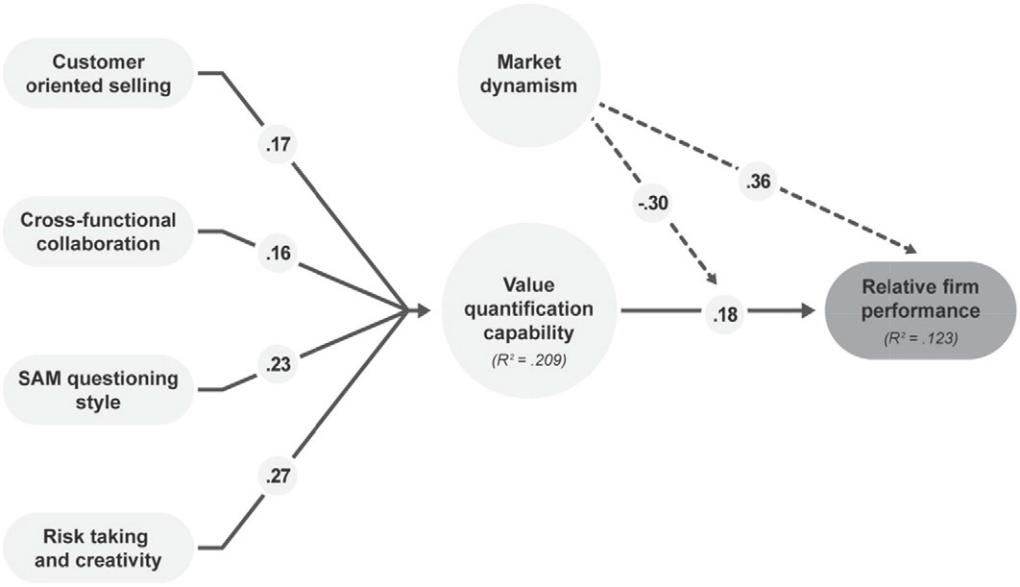


Fig. 3. Final structural model.

the relationship between individual value-quantification capability and short-term individual performance is all but straightforward. Short-term individual performance in B2B is influenced by a number of factors: the fit between the own offer and customer purchase criteria (or, put differently, high current performance is also the result of the ability of sales managers to influence customer purchase criteria in the first place), current economic conditions (recession vs. growth), sales manager access at the customer company (procurement vs. decision maker), the stage of the customer in the decision-making process (information gathering vs. final negotiations with qualified suppliers), and the maturity of customers themselves (selection based on price vs. selection based on value). At the organizational level, these factors seem to balance out, but at the level of individual sales managers, a high level of value quantification capability does not automatically lead to immediate superior performance. The factors mentioned are moderators that could influence the strength of the relationship between the individual value quantification capability and individual performance. One interviewee, for example, comments on the performance benefits of value quantification (Hinterhuber & Kemps, 2017, p. 173):

> So yes, that's why simply—in Japan they say, there is a beautiful expression, they call it, "You have to be prepared to sit on a rock for three years," which means that sometimes you just kind of have to be in a difficult painful situation before you get results, and fortunately—I know that's difficult for many of my colleagues, but fortunately I'm in an organization where that is understood that things may take time and that it's accepted that you need to sometimes make a significant investment to service that customer in order to achieve a longer term sustainable success, and I'm very well aware that that's not the case in all organizations.
>
> [Kemps, Global Sales Director, DHL]

Selling is complex (Franke & Park, 2006). At the level of the individual sales manager, the model presented here does not find that the value quantification capability translates to superior short-term performance, that is, sales. The data in this study thus raise the question of what superior sales manager performance actually is. Superior performance at the individual level could be, as the interviewee suggested, "waiting," in other words, relationship building, value verification, customer-supporting activities, information gathering—and not selling. Future studies thus should expand on the idea of defining sales manager performance and could subsequently attempt to include a broader set of factors that examine under which conditions individual value-quantification capabilities improve individual performance.

Fourth, this study examines the individual-level antecedents of the value quantification capability. The data in this study indicate that four factors are positively associated with value quantification capability: risk taking and creativity, sales manager questioning style, customer-oriented sales, and cross-functional collaboration. Value is subjective and uncertain: risk-seeking behaviour and an entrepreneurial attitude are beneficial for value quantification. Value quantification requires the ability to understand the business impact of the products or services offered: SPIN selling (Rackham, 1988), only apparently an old dog, is beneficial: value quantification capabilities are highest in sales managers who predominantly ask implication and need-payoff questions. Financial acumen, rather than the more-generic active emphatic listening skills, is thus critically important for value quantification. Sales

Table 5
Summary of hypothesis testing and findings.

Hypothesis and path		Path	
H1	Listening on value quantification	–	
H2	Customer linking on value quantification	–	
H3	Customer-oriented selling on value quantification	0.17	*
H4	Cross functional collaboration on value quantification	0.16	*
H5	SAM questioning on value quantification	0.23	*
H5a	Situational questions	0.28	*
H5b	Problem questions	0.29	*
H5c	Implication questions	0.27	*
H5d	Needs questions	0.36	*
H6	Self-efficacy on value quantification	–	
H7	Risk taking and creativity on value quantification	0.27	*
H8	Value quantification on relative firm performance	0.18	*
H9	Value quantifications on individual performance	–	
Moderating effect			
H8a	Market dynamism on value quantification and relative firm performance	−0.30	*
H8b	Market dynamism on value quantification and individual performance	–	
H9a	Relative product advantage on value quantification and relative firm performance	–	
H9b	Relative product advantage on value quantification and individual performance	–	

* $p < 0.05$.

managers thus need to possess the insight, intelligence, and customer knowledge necessary to ask meaningful questions that explore the financial consequences of the value proposition. A genuine customer orientation is furthermore beneficial for value quantification capability: understanding customer needs and a willingness not to sell unless in the customer's own best interest are salient aspects of this ability. This unwillingness to sell unless in the customer's best interest may partly explain the absence of a direct relationship between value quantification capability and individual performance. Value quantification finally requires cross-functional collaboration: sales managers need to liaise with different stakeholders in order to synthesize and integrate how different departments within the firm create financial value for customers.

The following picture emerges at the level of micro-foundations of the value quantification capability: an entrepreneurial, risk-seeking individual with a high level of financial acumen, exhibiting a genuine customer orientation that puts understanding ahead of selling, and an ability to coordinate different functions internally emerge as behavioural traits that enable the formation of the value quantification capability at the level of individual sales and account managers.

7. Implications for B2B marketing practice and theory

This study has important implications for B2B marketing practice. Value quantification capabilities at the level of sales and account managers matter, and for all products and under all environmental conditions: value quantification capabilities always improve overall firm performance. Under conditions of high market dynamism, value quantification capabilities are still beneficial, but less so than in stable markets. This finding implies that companies are well advised to invest in developing sales and account manager value-quantification capabilities regardless of whether they sell (apparent) commodities or highly differentiated products and regardless of whether they operate in stable or highly dynamic markets. Value quantification capabilities are always beneficial and especially so when markets are relatively stable.

The data indicate that value quantification capabilities do not lead to higher individual performance: short-term individual performance is influenced by other factors not examined in detail herein. This study also suggests avenues to develop value quantification capabilities at the level of individual sales and account managers. Encouraging risk taking, experimentation, fostering creativity and cross-functional collaboration, educating sales managers to ask the right questions during the sales encounter—that is, implication and need-payoff questions—and championing a true customer orientation that puts customer needs ahead of short-run revenue realization are measures that senior executives in B2B can and should implement to develop value quantification capabilities within their organization.

To senior executives, this study can further provide guidance in hiring and promotion decisions: in many companies there probably are customers or sales territories where value quantification is critically important, either because customers negotiate aggressively (Wieseke, Alavi, & Habel, 2014) or because customers themselves demand a quantified value proposition (Ernst & Young, 2002). The behavioural traits that this study identifies—risk taking and creativity or SPIN questioning style, for example—can be used to identify the most suitable sales managers and allocate them to customers where these value quantification capabilities are needed most.

This study also contributes significantly to B2B marketing theory. The study identifies a new construct, value quantification capability, as an important, albeit hitherto unexamined, antecedent of firm performance in B2B markets. Value quantification capabilities are elements of value-based selling capabilities (Terho et al., 2012) or, more generally, of salesforce capabilities (Guenzi, Sajtos, & Troilo, 2016), and future studies could examine the relative contribution of these capabilities to sales performance vis-à-vis other, related capabilities, such as customer insight generation, market opportunity identification, offer development, pricing, sales negotiation, or offer delivery capabilities.

By identifying a moderator, this study provides a rich and nuanced picture of the role of value quantification capabilities in industrial markets. It also sheds light on the individual-level micro-foundations of the capability to quantify value in B2B and thus suggests the existence of a link between psychological traits and behaviours at the individual level and outcomes at the level of the firm.

The examination of micro-foundations of marketing strategy is a particular fruitful research domain: some desirable activities and capabilities may be difficult to observe in practice; an understanding of their micro-level foundations allows researchers and managers to identify relevant proxies for such behaviours and capabilities (Storbacka, Brodie, Böhmann, Maglio, & Nenonen, 2016). Current research identifies links between these micro-foundations, such as thinking styles or personality types, and sales performance (Fraenkel, Haftor, & Pashkevich, 2016; Groza, Locander, & Howlett, 2016; Lussier & Hartmann, 2017); research on the micro-foundations of marketing capabilities is, however, still in its infancy, and this study aims to contribute to research in this emerging domain.

This study also points towards future studies that are needed to enhance the understanding of the benefits and the limits of value quantification in industrial markets: given the explorative nature of the present study, more research is warranted to broaden the understanding of value quantification capabilities and their importance in contexts that are dynamic: value co-creation processes, new product innovation, or new customer acquisition and the role of value quantification capabilities therefore appear as fertile research grounds.

8. Limitations

This study has limitations: at a fundamental level, the ability to quantify value has to be raised. The great economist Alfred Marshall (1925, p. 422) wrote over a century ago:

> In my view every economic fact, whether or not it is of such a nature as to be expressed in numbers, stands in relation as cause and effect to many other facts: and since it *never* happens that all of them can be expressed in numbers, the application of exact mathematical methods to those which can, is nearly always a waste of time, while in the large majority of cases it is positively misleading; and the world would have been further on its way forward if the work had never been done at all.

Applied to the mundane topic of value quantification, these words thus at least suggest that more research is needed to explore, to cite an example, the relationship between ex-ante value quantification and ex-post value verification. Also here, individual characteristics of sales and account managers could play a role.

Further limitations relate to the response rate, sample size, and measurement model. To address these limitations, the current study should be replicated with a larger sample and using a CB-SEM approach to better examine these relationships and the psychometric properties of the research model. Furthermore, it is expected that CB-SEM approaches will be better able to address potential issues of multicollinearity and that more latent constructs will be able to be retained in the final structural models. Additionally, the current study and PLS-SEM methods could control for potential covariate ways. Further covariance-based models may be needed to examine the impact that firm-level factors may have on the relationships described in this study.

Finally, future studies should apply configurational theory (Isaksson & Woodside, 2016; Woodside, 2015a; Woodside, 2016), as opposed to variable-based approaches, to the study of value quantification. Fuzzy-set qualitative comparative analysis (Ordanini, Parasuraman, & Rubera, 2013; Woodside, 2015b) appears particularly promising.

Acknowledgements

The author wishes to thank the following individuals for their contributions to the present study: Evandro Pollono (data collection), John Maddox (data analysis), Candi Wong (graphics), Kristen Ebert-Wagner (editing). In addition, two reviewers and Arch Woodside contributed substantially towards improving the present paper.

Appendix A. Constructs and scales.

Measures	Items	Sources
Active emphatic listening	Please indicate your agreement with the statements below: During a sales encounter with a major customer… I listen for more than just the spoken words I assure my customers that I am receptive to their ideas I ask questions that show my understanding of my customers' position I show my customers that I am listening by my body language (e.g. head nods) I understand why my customers feel the way they do	5 items, 7 point scale, CR α: 0.785 Drollinger and Comer (2013)
Customer linking capabilities	How would you rate the capabilities of your organization in the following areas? Ability to provide superior levels of customer service and support Quality of relationships with key target customers Ability to understand customer needs and requirements Ability to create relationships with customers Ability to maintain and improve relationships with customers	5 items, 5-item scale (anchored at "strong competitors' advantage" and "our strong advantage"), Hooley et al. (2005)
Customer-oriented selling	*Customer orientation* Please think of a typical sales encounter. Do you agree with the following statements? I try to get customers to discuss their needs with me. A good salesperson has to have the customer's best interests in mind. I try to bring a customer with a problem together with a product that helps solve that problem. I offer the product of mine that is best suited to the customer's problem. I try to find out what kind of product would be most helpful to a customer. *Selling orientation* Please think of a typical sales encounter. Do you agree with the following statements? I try to sell as much as I can rather than satisfy a customer. (R) It is necessary to stretch the truth in describing a product to a customer. (R) I try to sell a customer all I can convince him/her to buy even if I think it is more than a wise person would buy.(R) I paint too rosy a picture of my product, to make them appear as good as possible. (R) I decide what products to offer on the basis of what products I can convince customers to buy, not on the basis of what will satisfy them in the long run. (R)	10 items, 7-point scale (anchored at "do not agree at all" and "fully agree") Periatt et al. (2004), Schwepker and Good (2012);
Cross functional collaboration	This area is focused the importance of collaborating with colleagues and management in order to meet client needs. Please indicate the level of agreement for the following statements regarding collaboration with other departments: I rely on my peers from other departments in order to meet my customers' needs. I communicate with my colleagues on proposed solutions for my clients. I consistently share client information with others in the company. Communicating client needs is important in winning business. Communicating client needs is important for client retention. Communicating client needs is important in achieving customer satisfaction. I communicate with my sales manager regarding potential sales opportunities.	7 items, 7-point scale (anchored at "strongly disagree" and "strongly agree"), Rodriguez and Honeycutt (2011)
Sales manager questioning style	Which of the following statements best describes your preferred way of asking questions during a sales encounter? I spend a lot of time asking questions about the customer's current situation (E.g. *"Who are your main competitors?" "From whom else to you buy similar products to our own products?"*) I spend a lot of time asking questions about the customer's problems, difficulties, or dissatisfactions (E.g. *"What prevents you from achieving higher quality?"*) I spend a lot of time asking questions about the consequences of the customer's problems on her/his operations (E.g. *"What effect does this problem have on output?"*) I spend a lot of time asking questions about the payoff of a possible solution on the customer's operations (E.g. *"If we did XXX, how much would you save?"*)	New construct, adapted from Rackham (1988), 4 items, 7-point scale (anchored at "does not apply at all" and "fully applies").

(continued on next page)

(*continued*)

Measures	Items	Sources
Self-efficacy	Please tell us to what extent you agree with the following statements regarding your current role: My job is well within the scope of my abilities. I feel I am overqualified for the job I am doing. I feel confident that my skills and abilities equal or exceed those of my colleagues. My past experiences and accomplishments increase my confidence that I will be able to perform successfully in this organization. I could have handled a more challenging job Professionally speaking, my new job exactly satisfies my expectations of myself. (R)	6 items, 7-point scale (anchored at "strongly disagree" and "strongly agree"), Jones (1986)
Risk taking and creativity	Do you agree with the following statements about yourself? I am willing to take risks I am willing to try new projects and ideas I have a rich entrepreneurial spirit I am creative	4 items, 7-point scale (anchored at "strongly disagree" and "strongly agree"), Wang et al. (2011)
Value quantification capability	Imagine a typical sales encounter with a large customer. The customer objects on price. In addition to the statement "Our product/service is better" do you… Perform total cost of ownership (TCO) calculations versus key competitive offerings Use factual data to demonstrate that the value of our products and services is higher than your price. Justify the price premium of your products/services over competing offers via a documentation and quantification of the incremental value to customers. Quantify how much also intangible benefits (e.g. better reputation) could be worth to customers Translate performance differences between competitive products in monetary terms ($ or €) Use value calculators or other value quantification tools	New construct; 6 items, 7 point scale (anchored at "almost never" and "nearly always")
Relative product advantage	How do you estimate the relative advantages of your products and services with competitors' products or services, for… Uniqueness Product/service quality Differentiation Overall performance	4 items, 7 point scale (anchored at "very weak" and "very strong"), adapted from: Gatignon and Xuereb (1997)
Market dynamism	Please indicate the frequency of changes in the following aspects of your business environment: New competitive entries Changes in products offered by competitors. Changes in competitor pricing strategies/tactics Changes in sales advertising strategies of competitors. Changes in distribution strategies of competitors	5 items, 7 point scale (anchored at "very infrequently" and "very frequently") Homburg and Pflesser (2000)
Firm relative performance	Please evaluate the performance of your major line of business over the past year relative to your major competitors Sales growth Absolute operating profitability (EBIT/sales) Growth in operating profitability (EBIT/sales)	3 items, 7-point scale (anchored at "much worse" and "much better than competitors") Morgan et al. (2009)
Individual performance	Relative to a colleague operating in a similar position to your own, how do you estimate… your sales volume in the past year the average price level of your deals in the past year.	2 items, 7-point scale (anchored at "much lower" and "much better") Piercy et al. (2001)

References

Adade, M., & Simonetti, A. (2013). *The collection - Examples of true excellence in marketing and sales at DSM, DSM internal publication*. The Netherlands: Heerlen.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411–423.

Anderson, J. C., Narus, J. A., & Van Rossum, W. (2006). Customer value propositions in business markets. *Harvard Business Review*, *84*(3), 90.

Anderson, J., Kumar, N., & Narus, J. (2007). *Value merchants: Demonstrating and documenting superior value in business markets*. Boston, MA: Harvard Business School Press.

Anderson, J., Narus, J., & Narayandas, D. (2008). *Business market management: Understanding, creating, and delivering value* (3rd ed.). Upper Saddle River, NJ.: Prentice Hall.

Bergkvist, L., & Rossiter, J. R. (2007). The predictive validity of multiple-item versus single-item measures of the same constructs. *Journal of Marketing Research*, *44*(2), 175–184.

Brown, S. P., Jones, E., & Leigh, T. W. (2005). The attenuating effect of role overload on relationships linking self-efficacy and goal level to work performance. *Journal of Applied Psychology*, *90*(5), 972–979.

Carlson, J. J., Gries, K. S., Yeung, K., Sullivan, S. D., & Garrison, L. P., Jr. (2014). Current status and trends in performance-based risk-sharing arrangements between healthcare payers and medical product manufacturers. *Applied Health Economics and Health Policy*, *12*(3), 231–238.

Chow, J. (2015, 17 March). Peugeot CEO uses cost cuts to turn corner on profitability. *The Wall Street Journal*.

Churchill, G. A., Jr. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, *16*(1), 64–73.

Day, G. (1994). The capabilities of market-driven organizations. *Journal of Marketing*, *58*(4), 37–52.

Dolan, R. J. (1996). *Black & Decker Corporation: Power tools division - video supplement (HBS product #: 596510-VID-ENG)*. Boston, MA: Harvard Business School.

Dolan, R. J. (1998). *Black & Decker Corporation: Power tools division - teaching note (HBS case no 5–598-106)* Boston, MA: Harvard Business School.

Donavan, D. T., Brown, T. J., & Mowen, J. C. (2004). Internal benefits of service-worker customer orientation: Job satisfaction, commitment, and organizational citizenship behaviors. *Journal of Marketing*, *68*(1), 128–146.

Drollinger, T., & Comer, L. B. (2013). Salesperson's listening ability as an antecedent to relationship selling. *Journal of Business & Industrial Marketing*, *28*(1), 50–59.

Echambadi, R., Campbell, B., & Agarwal, R. (2006). Encouraging best practice in quantitative management research: An incomplete list of opportunities. *Journal of Management Studies*, *43*(8), 1801–1820.

Eijkenaar, F., Emmert, M., Scheppach, M., & Schöffski, O. (2013). Effects of pay for performance in health care: A systematic review of systematic reviews. *Health Policy*, *110*(2), 115–130.

Ernst, & Young (2002). *Fortune 1000 IT buyer survey: What could shorten sales cycles and further increase win rates for technology vendors?* Economics & Business Analytics white paper.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39–50.

Fraenkel, S., Haftor, D. M., & Pashkevich, N. (2016). Salesforce management factors for successful new product launch. *Journal of Business Research*, *69*(11), 5053–5058.

Franke, G. R., & Park, J. -E. (2006). Salesperson adaptive selling behavior and customer orientation: A meta-analysis. *Journal of Marketing Research*, *43*(4), 693–702.

GAO (2004). *Defense Management - Opportunities to Enhance the Implementation of Performance-Based Logistics, United States Government Accountability Office, GAO-04-715.* Washington, D.C.

Garrison, L. P., Towse, A., Briggs, A., De Pouvourville, G., Grueger, J., Mohr, P. E., ... Sleeper, M. (2013). Performance-based risk-sharing arrangements - Good practices for design, implementation, and evaluation: Report of the ISPOR good practices for performance-based risk-sharing arrangements task force. *Value in Health*, *16*(5), 703–719.

Gatignon, H., & Xuereb, J. -M. (1997). Strategic orientation of the firm and new product performance. *Journal of Marketing Research*, *37*(1), 77–90.

Gravelle, H., Sutton, M., & Ma, A. (2010). Doctor behaviour under a pay for performance contract: Treating, cheating and case finding? *The Economic Journal*, *120*(542), 129–156.

Grönroos, C., & Voima, P. (2013). Critical service logic: Making sense of value creation and co-creation. *Journal of the Academy of Marketing Science*, *41*(2), 133–150.

Groza, M. D., Locander, D. A., & Howlett, C. H. (2016). Linking thinking styles to sales performance: The importance of creativity and subjective knowledge. *Journal of Business Research*, *69*(10), 4185–4193.

Guenzi, P., Sajtos, L., & Troilo, G. (2016). The dual mechanism of sales capabilities in influencing organizational performance. *Journal of Business Research*, *69*(9), 3707–3713.

Haas, A., Snehota, I., & Corsaro, D. (2012). Creating value in business relationships: The role of sales. *Industrial Marketing Management*, *41*(1), 94–105.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, *40*(3), 414–433.

Hendrickson, M. A. (2008). Pay for performance and medical professionalism. *Quality Management in Healthcare*, *17*(1), 9–18.

Hinterhuber, A. (2004). Towards value-based pricing—An integrative framework for decision making. *Industrial Marketing Management*, *33*(8), 765–778.

Hinterhuber, A. (2008). Customer value-based pricing strategies: Why companies resist. *Journal of Business Strategy*, *29*(4), 41–50.

Hinterhuber, A., & Heutger, M. (2017). Interview: Implementing value quantification in B2B. In A. Hinterhuber, & T. Snelgrove (Eds.), *Value first, then price: Quantifying value in business markets from the perspective of both buyers and sellers* (pp. 153–160). Milton Park, UK: Routledge.

Hinterhuber, A., & Kemps, P. (2017). Interview: The ring of truth - Value quantification in B2B services. In A. Hinterhuber, & T. Snelgrove (Eds.), *Value first, then price: Quantifying value in business markets from the perspective of both buyers and sellers* (pp. 161–177). Milton Park, UK: Routledge.

Hinterhuber, A., & Snelgrove, T. (2016). Interview with an expert: Mr. Todd Snelgrove, Chief Value Officer, SKF. In A. Hinterhuber, & S. Liozu (Eds.), *Pricing and the sales force* (pp. 24–29). Milton Park, UK: Routledge.

Hinterhuber, A., Snelgrove, T., & Quancard, B. (2017). Interview: Nurturing value quantification capabilities in strategic account managers. In A. Hinterhuber, & T. Snelgrove (Eds.), *Value first, then price: Quantifying value in business markets from the perspective of both buyers and sellers* (pp. 39–48). Milton Park, UK.: Routledge.

Homburg, C., & Pflesser, C. (2000). A multiple-layer model of market-oriented organizational culture: Measurement issues and performance outcomes. *Journal of Marketing Research*, *37*(4), 449–462.

Homburg, C., Allmann, J., & Klarmann, M. (2014). Internal and external price search in industrial buying: The moderating role of customer satisfaction. *Journal of Business Research*, *67*(8), 1581–1588.

Hooley, G. J., Greenley, G. E., Cadogan, J. W., & Fahy, J. (2005). The performance impact of marketing resources. *Journal of Business Research*, *58*(1), 18–27.

Hünerberg, R., & Hüttmann, A. (2003). Performance as a basis for price-setting in the capital goods industry:: Concepts and empirical evidence. *European Management Journal*, *21*(6), 717–730.

Hunt, J. M., & Forman, H. (2006). The role of perceived risk in pricing strategy for industrial products: A point-of-view perspective. *Journal of Product & Brand Management*, *15*(6), 386–393.

Ingenbleek, P., Debruyne, M., Frambach, R. T., & Verhallen, T. M. M. (2003). Successful new product pricing practices: A contingency approach. *Marketing Letters*, *14*(4), 289–305.

Ingenbleek, P., Frambach, R. T., & Verhallen, T. M. (2013). Best practices for new product pricing: Impact on market performance and price level under different conditions. *Journal of Product Innovation Management*, *30*(3), 560–573.

Isaksson, L. E., & Woodside, A. G. (2016). Modeling firm heterogeneity in corporate social performance and financial performance. *Journal of Business Research*, *69*(9), 3285–3314.

ISBM (2012). *Insights to action – ISBM B2B marketing trends 2012, Institute for the Study of Business Markets.* University Park, PA (USA): Smeal College, Penn State University.

Johnstone, T. (2007). Book cover quote. In J. C. Anderson, N. Kumar, & J. Narus (Eds.), *Value merchants: Demonstrating and documenting superior value in business markets*. Boston, MA.: Harvard Business School Press.

Jones, G. R. (1986). Socialization tactics, self-efficacy, and newcomers' adjustments to organizations. *Academy of Management Journal*, *29*(2), 262–279.

Kähkönen, M. (2012). *Creating long-term value Metso Investor Conference (Metso Capital Day Markets).* (Vantaa (Finland)).

Keränen, J., & Jalkala, A. (2013). Towards a framework of customer value assessment in B2B markets: An exploratory study. *Industrial Marketing Management*, *42*(8), 1307–1317.

Kindström, D., Kowalkowski, C., & Nordin, F. (2012). Visualizing the value of service-based offerings: Empirical findings from the manufacturing industry. *Journal of Business & Industrial Marketing*, *27*(7), 538–546.

Koning, P., & Heinrich, C. J. (2013). Cream-skimming, parking and other intended and unintended effects of high-powered, performance-based contracts. *Journal of Policy Analysis and Management*, *32*(3), 461–483.

Krishnamurthy, C., Johansson, J., & Schlissberg, H. (2003). *Solutions selling: Is the pain worth the gain?* McKinsey Marketing Solutions.

Kumar, V., Jones, E., Venkatesan, R., & Leone, R. P. (2011). Is market orientation a source of sustainable competitive advantage or simply the cost of competing? *Journal of Marketing*, *75*(1), 16–30.

Lancioni, R. A. (2005). A strategic approach to industrial product pricing: The pricing plan. *Industrial Marketing Management*, *34*(2), 177–183.

Lancioni, R., Schau, H. J., & Smith, M. F. (2005). Intraorganizational influences on business-to-business pricing strategies: A political economy perspective. *Industrial Marketing Management*, *34*(2), 123–131.

Liozu, S. (2015). Pricing superheroes: How a confident sales team can influence firm performance. *Industrial Marketing Management*, *47*, 26–38.

Lussier, B., & Hartmann, N. N. (2017). How psychological resourcefulness increases salesperson's sales performance and the satisfaction of their customers: Exploring the mediating role of customer-oriented behaviors. *Industrial Marketing Management*, *59* (in print).

Marketing Science Institute. (2010). 2010–2012 research priorities. In M.S. Institute (Ed.). (Cambridge, MA (USA)).

Marketing Science Institute. (2014). 2014–2016 research priorities. In M.S. Institute (Ed.) (Cambridge, MA (USA)).

Marshall, A. (1925). Letter to A. L. Bowley, 3 March 1901. In A. C. Pigou (Ed.), *Memorials of Alfred Marshall* (pp. 422). London, UK: Macmillan.

McMurchy, N. (2008). *Tough times in IT: How do you exploit the opportunities?* Gartner Presentation.

Morgan, N. A., Vorhies, D. W., & Mason, C. H. (2009). Market orientation, marketing capabilities, and firm performance. *Strategic Management Journal*, *30*(8), 909–920.

Nagle, T., & Cressman, G. (2002). Don't just set prices, manage them. *Marketing Management*, *11*(6), 29–33.

Nagle, T., & Holden, R. (2002). *The strategy and tactics of pricing: A guide to profitable decision making* (3rd ed.). NJ: Prentice Hall Englewood Cliffs.

Nagle, T., Hogan, J., & Zale, J. (2011). *The strategy and tactics of pricing: A guide to growing more profitably* (5th ed.). Upper Saddle River, NJ: Prentice Hall.

Narver, J. C., & Slater, S. F. (1998). Additional thoughts on the measurement of market orientation: A comment on Deshpandè and Farley. *Journal of Market-Focused Management*, *2*(3), 233–236.

Ng, I. C., Ding, D. X., & Yip, N. (2013). Outcome-based contracts as new business model: The role of partnership and value-driven relational assets. *Industrial Marketing Management*, *42*(5), 730–743.

Nunally, J., & Bernstein, I. (1994). *Psychometric theory* (3rd ed.). New York, NY: McGraw-Hill.

Nunnally, J. (1978). *Fundamentals of factor analysis. Psychometric theory* (2nd ed.). New York, NY: McGraw-Hill Book Company, 327–404.

Ordanini, A., Parasuraman, A., & Rubera, G. (2013). When the recipe is more important than the ingredients: A qualitative comparative analysis (QCA) of service innovation configurations. *Journal of Service Research*, *17*(2), 134–149.

Pelham, A. M. (2010). The impact of salesperson perception of firm market orientation on behaviors and consulting effectiveness. *Journal of Business-to-Business Marketing*, *17*(2), 105–126.

Periatt, J. A., LeMay, S. A., & Chakrabarty, S. (2004). The selling orientation–customer orientation (SOCO) scale: Cross-validation of the revised version. *Journal of Personal Selling & Sales Management*, *24*(1), 49–54.

Piercy, N. F., Cravens, D. W., & Lane, N. (2001). Sales manager behavior control strategy and its consequences: The impact of gender differences. *Journal of Personal Selling & Sales Management*, *21*(1), 39–49.

Piscopo, G., Johnston, W., & Bellenger, D. (2008). Total cost of ownership and customer value in business markets. *Advances in Business Marketing and Purchasing*, *14*, 205–220.

Plank, R. E., & Ferrin, B. G. (2002). How manufacturers value purchase offerings: An exploratory study. *Industrial Marketing Management*, *31*(5), 457–465.

Plouffe, C. R., Williams, B. C., & Wachner, T. (2008). Navigating difficult waters: Publishing trends and scholarship in sales research. *Journal of Personal Selling & Sales Management*, *28*(1), 79–92.

Rackham, N. (1988). *SPIN selling.* New York, NY: McGraw-Hill.

Richards, K. A., Moncrief, W. C., & Marshall, G. W. (2010). Tracking and updating academic research in selling and sales management: A decade later. *Journal of Personal Selling & Sales Management*, *30*(3), 253–271.

Ridsdale, M. (2011). *Steel - Industry background and analysis analyst report.* Sydney (Australia): Resource Capital Research.

Rodriguez, M., & Honeycutt, E. D., Jr. (2011). Customer relationship management (CRM)'s impact on B to B sales professionals' collaboration and sales performance. *Journal of Business-to-Business Marketing*, *18*(4), 335–356.

Roegner, E., & Gobbi, J. (2001). *Effective solutions pricing: How to get the best premium from strategic collaborations McKinsey marketing solutions.* McKinsey & Company.

Sackett, P. R., & Larson, J. R. (1990). Research strategies and tactics in industrial and organizational psychology. In M. D. Dunnette, & L. M. Hough (Eds.), *Handbook of industrial*

and organizational psychology, vol. 1. (pp. 419–489). Palo Alto, CA: Consulting Psychologists Press.
Sapienza, H. J., Smith, K. G., & Gannon, M. J. (1988). Using subjective evaluations of organizational performance in small business research. *American Journal of Small Business*, *12*(3), 45–53.
Schwepker, C. H., & Good, D. J. (2012). Sales quotas: Unintended consequences on trust in organization, customer-oriented selling, and sales performance. *Journal of Marketing Theory and Practice*, *20*(4), 437–452.
Selviaridis, K., & Wynstra, F. (2015). Performance-based contracting: A literature review and future research directions. *International Journal of Production Research*, *53*(12), 3505–3540.
Simsek, Z. (2007). CEO tenure and organizational performance: An intervening model. *Strategic Management Journal*, *28*(6), 653–662.
Simsek, Z., Veiga, J. F., Lubatkin, M. H., & Dino, R. N. (2005). Modeling the multilevel determinants of top management team behavioral integration. *The Academy of Management Journal*, *48*(1), 69–84.
Storbacka, K. (2011). A solution business model: Capabilities and management practices for integrated solutions. *Industrial Marketing Management*, *40*(5), 699–711.
Storbacka, K., Brodie, R. J., Böhmann, T., Maglio, P. P., & Nenonen, S. (2016). Actor engagement as a microfoundation for value co-creation. *Journal of Business Research*, *69*(8), 3008–3017.
Terho, H., Haas, A., Eggert, A., & Ulaga, W. (2012). 'It's almost like taking the sales out of selling'—Towards a conceptualization of value-based selling in business markets. *Industrial Marketing Management*, *41*(1), 174–185.
Terho, H., Eggert, A., Haas, A., & Ulaga, W. (2015). How sales strategy translates into performance: The role of salesperson customer orientation and value-based selling. *Industrial Marketing Management*, *45*, 12–21.
Töytäri, P., & Rajala, R. (2015). Value-based selling: An organizational capability perspective. *Industrial Marketing Management*, *45*, 101–112.
Töytäri, P., Brashear, T., Parvinen, P., Ollila, I., & Rosendahl, N. (2011). Bridging the theory to application gap in value-based selling. *Journal of Business & Industrial Marketing*, *26*(7), 493–502.
Töytäri, P., Rajala, R., & Alejandro, T. B. (2015). Organizational and institutional barriers to value-based pricing in industrial relationships. *Industrial Marketing Management*, 47.
Wang, H., Tsui, A. S., & Xin, K. R. (2011). CEO leadership behaviors, organizational performance, and employees' attitudes. *The Leadership Quarterly*, *22*(1), 92–105.
Weibel, A., Rost, K., & Osterloh, M. (2010). Pay for performance in the public sector—Benefits and (hidden) costs. *Journal of Public Administration Research and Theory*, *20*(2), 387–412.
Weissert, W. G., & Frederick, L. F. (2013). Pay for performance: Can it help improve nursing home quality? *Public Administration Review*, *73*(S1), 140–151.
Wiersema, F. (2013). The B2B agenda: The current state of B2B marketing and a look ahead. *Industrial Marketing Management*, *42*(4), 470–488.
Wieseke, J., Alavi, S., & Habel, J. (2014). Willing to pay more, eager to pay less: The role of customer loyalty in price negotiations. *Journal of Marketing*, *78*(6), 17–37.
Woodside, A. G. (2015a). Constructing business-to-business marketing models that overcome the limitations in variable-based and case-based research paradigms. *Journal of Business-to-Business Marketing*, *22*(1–2), 95–110.
Woodside, A. G. (2015b). The general theory of behavioral pricing: Applying complexity theory to explicate heterogeneity and achieve high-predictive validity. *Industrial Marketing Management*, *47*, 39–52.
Woodside, A. (2016). Diffusion and adoption of good science: Overcoming the dominant logic of NHST and the reporting of rubbish. *Working paper*. Curtin University.
Wouters, M. (2010). Customer value propositions in the context of technology commercialization. *International Journal of Innovation Management*, *14*(06), 1099–1127.
Wouters, M., & Kirchberger, M. A. (2015). Customer value propositions as interorganizational management accounting to support customer collaboration. *Industrial Marketing Management*, *46*, 54–67.
Zablah, A. R., Franke, G. R., Brown, T. J., & Bartholomew, D. E. (2012). How and when does customer orientation influence frontline employee job outcomes? A meta-analytic evaluation. *Journal of Marketing*, *76*(3), 21–40.
Zeithaml, V. (1988). Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing*, *52*(3), 2–22.

Journal of Business Research 76 (2017) 179–188

Contents lists available at ScienceDirect

Journal of Business Research

The micro-foundations of pricing strategy in industrial markets: A case study in the European packaging industry☆

Niklas L. Hallberg

Department of Business Administration, School of Economics and Management, Lund University, PO Box 7080, SE-220 07 Lund, Sweden

ARTICLE INFO

Article history:
Received 25 June 2015
Accepted 20 February 2016
Available online 6 January 2017

Keywords:
Human capital
Judgment
Micro-foundations
Pricing strategy
Value appropriation

ABSTRACT

The choice and implementation of pricing strategy is often described as an optimization problem where the firm chooses the most profitable pricing strategy given certain external determinants. Contrary to this notion, recent research indicates that the pricing of products is a costly and complex activity, and that firms may differ in their capability to implement pricing strategies. This case study of industrial pricing strategy in the European packaging industry examines how different assets and routines are involved in the implementation of pricing strategy. The study particularly highlights the role of individual judgment, human capital and commercial experience for the implementation of pricing strategy in markets that because of customization are subject to high levels of uncertainty.

1. Introduction

How is the choice and implementation of pricing strategy in industrial markets affected by firm-specific assets and routines? The choice of pricing strategy is in a large part of the pricing literature described as frictionless, profit maximizing and mainly affected by external determinants (e.g., Forman & Hunt, 2005; Nagle & Holden, 2002; Noble & Gruca, 1999; Tellis, 1986). Contrary to this notion of pricing strategy, other studies stress that firms incur substantial physical-, managerial-, and customer costs when setting and changing prices for their products, and that this may lead to significant price rigidity and path-dependence in pricing decisions (e.g., Bergen, Ritson, Dutta, Levy, & Zbaracki, 2003; Blinder, Elie, Canetti, & Rudd, 1998; Hallberg, 2008; Mankiw, 1985; Zbaracki, 2007; Zbaracki & Bergen, 2010; Zbaracki, Ritson, Levy, Dutta, & Bergen, 2004). This case study examines the challenges firms face when selecting and implementing industrial pricing strategies. Examples of challenges faced by the studied firms include keeping track of and pricing up to 5000 different references spread over a 1000 different customers, gaining access to and processing highly customer-specific information when putting together large industrial deals, and gaining control over key decision-makers in the pricing process that due to high levels of complexity and customization have significant individual discretion. The results of the study show that individual judgment, human capital and commercial experience are particularly important for the implementation of pricing strategy under these conditions.

The debate between those who view pricing strategy as an analytical exercise and those who view it as a complex organizational challenge points to a problematic research practice in pricing-, marketing-, and management research to import assumptions about human rationality and perfect information from economics despite the fact that these assumptions in many cases are unrealistic and highly problematic in the management context in which they are applied (Foss & Hallberg, 2015; Hallberg, 2015). A result of the practice of importing assumptions from economics is that organizational factors and micro-level mechanisms that affect the choice and implementation of strategy are downplayed (see Abell, Felin, & Foss, 2008; Felin & Foss, 2005; Levinthal, 2011; Powell, Lovallo, & Fox, 2011). For example, there remains important questions concerning why firms seem to resist value-based pricing strategies and techniques that from an analytical standpoint are most profitable (see Hallberg & Andersson, 2013; Hinterhuber, 2008a). Attempts at remedying this divide have been made by emphasizing price-setting practices (Ingenbleek & van der Lans, 2013), pricing orientation/approaches/practices (Hinterhuber, 2008b; Liozu & Hinterhuber, 2013), and value-based pricing (Hinterhuber, 2004; Liozu, Hinterhuber, Boland, & Perelli, 2012). Nonetheless, a review shows that there is a gap in the pricing- and management literature: We lack *sufficient* empirical analysis of the organizational and micro-level mechanisms associated with identifying and implementing industrial pricing strategies. While prior research on price adjustment costs (e.g., Zbaracki, 2007, etc.) and pricing capability (Andersson, 2013; Dutta, Zbaracki, & Bergen, 2003; Hallberg, 2008; Liozu & Hinterhuber, 2013) have contributed substantially to our understanding of the type of investments firms make in order to develop their capability to set and change prices and how this might affect competitive advantage, there still remain important questions

☆ I am grateful to Andreas Hinterhuber, Stephan Liozu, and two reviewers of this journal for comments on previous versions of this article. The usual disclaimer applies.
E-mail address: niklas.hallberg@fek.lu.se.

http://dx.doi.org/10.1016/j.jbusres.2017.01.001
0148-2963/

regarding *how* the implementation of differential pricing strategies are affected by individual judgment, assets, and routines.

This study examines how three firms in the European packaging industry have implemented their pricing strategies. The study specifically highlights the micro-foundations of industrial pricing strategy by focusing on the internal resources and processes of the seller.[1] The results show that differences in pricing strategy can be described along dimensions such as price discrimination, operating leverage, and price elasticity, where each dimension is associated with specific types of decisions and supporting assets and routines. Among other things, the results indicate that the implementation of pricing strategy may be severely restricted by firms' ability to hire the right individuals and develop the specific assets and routines that enable a particular pricing strategy. While these restrictions may be viewed as bad news for pricing strategists who want to rapidly change their firm's pricing strategy, it may also be seen as proof of the strategic nature of pricing and the fact that firms may gain competitive advantage from implementing a superior pricing strategy that due to rigidities and path-dependence in the underlying resource-base is not immediately available to competitors (Barney, 1991).

2. Theoretical background

A firm's pricing strategy is a policy or schedule that the firm develops in order to govern how its prices vary over products, customers, or time. In line with definitions provided by other authors (e.g., Forman & Hunt, 2005; Hinterhuber, 2004; Liozu & Hinterhuber, 2013; Noble & Gruca, 1999; Tellis, 1986), pricing strategy is viewed as the means by which a firm achieves specific market outcomes in response to a given scenario by the use of a certain price. Micro-foundations, in turn, refer to "how intentional human action and interaction causally produce strategic phenomena" (Abell et al., 2008: 492). The framework presented in this section relates micro-foundations grounded in psychology (e.g., Goldstein & Gigerenzer, 2002; Kahneman, 2003) with pricing strategy by outlining the specific types of individual judgments, assets, routines that firms rely on when implementing pricing strategies.

2.1. The micro-foundations of pricing strategy

Given the evidence speaking in favor of certain pricing strategies, such as value-based pricing strategy (Liozu & Hinterhuber, 2013), one would expect most firms to choose and implement these strategies using the latest tools and techniques available. However, the fact that this is not always the case suggests that there may be significant barriers present in the process of implementing new pricing strategies that prevent firms from choosing the most optimal strategy (Hinterhuber, 2008a). For example, studies indicate that sales force management, organizational control, and pricing delegation may be particularly problematic areas for firms seeking to implement value-based pricing (Hallberg & Andersson, 2013).

Pricing decisions are, as most forms of business-decisions, made by bounded rational decision-makers acting under some level of complexity (Simon, 1945). In cases where complexity and uncertainty is high, the application of programed and institutionalized solutions are ruled out in favor of more intuitive approaches, individual discretion and judgment (see Foss & Klein, 2012). Judgment has been subject to extensive research in psychology and behavioral economics (e.g., Gigerenzer, 1991; Gigerenzer & Hoffrage, 1995; Goldstein & Gigerenzer, 2002; Kahneman, 2003; Smith, 1991, 2003, 2008; Tversky & Kahneman, 1974, 1981). This research has developed into two approaches: one "cognitive bias approach" (e.g., Tversky & Kahneman, 1974) and one "fast and frugal heuristics approach" (e.g., Brighton & Gigerenzer, 2015). These approaches share an emphasis on *ecological rationality* (decision-makers rely on emergent heuristics and institutions adapted to the specific structure of the environment) over *constructivist rationality* (decision-makers rely on deliberate and maximizing rational choice).

The "cognitive biases approach" suggests that boundedly rational decision-makers in uncertain exchange relationships are subject to specific decision-biases (see Kahneman, 2003), but that these biases may be corrected for depending on actors' access to institutions and decision-supporting systems (Kahneman & Lovallo, 1993; Smith, 2008; Stanovich & West, 2000). The "fast and frugal heuristics approach", on the other hand, points to the individual-level functional heuristics that aid decision-making under uncertainty. Hence, while not adhering to rational choice principles, individuals faced with uncertainty should not be assumed to make biased choices, but rather to rely on heuristics that develop over time to fit the specific structure of the environment where decisions have historically been made (Mousavi & Kheirandish, 2014).

The studies in psychology and behavioral economics outlined above have important implications for the choice and implementation of pricing strategy: First, they imply that there is significant room for heterogeneity in individual judgment about prices (e.g., better/worse pricing decisions) and that pricing strategy may be significantly improved by understanding how individual judgment deviate from rational choice principles. Second, decision-makers have the opportunity to develop institutional responses to uncertain conditions in terms of acquiring or developing particular assets, routines and social structures to aid decision-making (see Raghubir, 2006). Relative prior studies, this implies novel forms of heterogeneity in the assets and routines that are acquired and developed to enable the implementation of pricing strategy. Specifically, firm-specific assets and routines may be understood as decision-supporting systems (in the sense of Kahneman, 2003) that allow for more effective use of commercial information in pricing decisions, while heterogeneous human capital and commercial experience are related to the individual-level heuristics that decision-makers develop when making judgments under uncertainty (see Brighton & Gigerenzer, 2015).

2.2. Assets and routines as foundations of pricing strategy

One business research area where decision-supporting structures have been given attention is in the literature on organizational capabilities (e.g., Amit & Schoemaker, 1993, etc.). Basic firm-level capabilities exist in different functional areas, such as manufacturing, marketing, sales, etc. Dutta et al. (2003) argue that firms develop specific organizational capabilities to support the execution of pricing related activities and the implementation of pricing strategy. Specifically, pricing capabilities affect firm performance by enabling greater value appropriation through prices that better match the perceived benefit of the product sold and the demand characteristics in the focal market. According to Dutta et al. (2003), pricing capability can be described in terms of particular routines, coordination mechanisms, systems, skills, and resources that enable activities of two kind: *price-setting capability within the firm* and *price-setting capability vis-à-vis customers*. The price-setting capability within the firm includes activities such as identifying competitor prices, setting pricing strategy, and translation from pricing strategy to price. The price-setting capability *vis-à-vis* customers involves activities such as convincing customers on the price change logic, and negotiating price changes with major customers.

Dutta et al. (2003) show how particular pricing outcomes result from firms' routines, coordination mechanisms, systems, skills, and resources. Further, the development of an effective pricing process (i.e., setting, changing and negotiating prices) is shown to be time-consuming, costly and complex with significant organizational and informational barriers restricting the process. Hence, the development of

[1] While important for a comprehensive analysis of market exchange, this study is not designed to examine the role of external factors and factors directly related to the buyer, such as market structure, customers' purchase volumes, relative negotiation power, etc.

pricing capability involves complex organizational and social components that evolve over long time periods: The ability to resolve these information asymmetries might thus not only constitute a valuable resource, it might also be difficult to transfer or imitate (see Barney, 1991; Dierickx & Cool, 1989).

In line with the above results, Bergen et al. (2003) argue that changing prices may be very costly in terms of the physical-, managerial-, customer resources that are consumed in the process. The cost of changing prices not only have a broad line of implications for economic explanation and how markets work (see Zbaracki, 2007), but also firm-level consequences such as heterogeneity and path-dependence in pricing-related assets and routines (Zbaracki & Bergen, 2010). Building on the abovementioned studies, this paper examines the micro-foundations of pricing strategy by studying how three firms in the European packaging industry implemented their pricing strategies. The study focuses particularly on the role of individuals and the relationship between individual judgment, assets, and routines and the pricing strategies that are implemented.

3. Method

3.1. Research setting

The study follows a multiple case study design (Eisenhardt, 1989; Yin, 2003) of three cases in the European packaging industry. Because of anonymity agreements with the respondents, the cases are presented using the pseudonyms CaCo, OppCo, and PremCo. All three cases were independently operating business units within a large pan European packaging company (PackComp). The company is organized in five different regions: Nordic, Middle Europe, Western Europe, UK & Ireland and Southern Europe. Each region contains a regional management team, but the responsibility for operations and sales is held by the individual profit center, which in some cases is a single production unit (plant) and in other cases a larger unit consisting of several plants. Each individual profit center is managed by a local management team lead by a general manager who has the overall profit responsibility for the unit.

The European packaging industry is a business-to-business environment where transactions are either priced "per order" or managed according to long-term contracts that stipulate price according to a pre-defined parameter (often paper costs). Pricing decisions are made at different organizational levels depending on the importance of the customer. Lower level officials price smaller orders/customers while orders and customers that are strategically important are priced at a management team level. Larger accounts that involve several business units are managed at either a national, regional or European level.

3.2. Selection of cases

The choice of studying pricing strategy in the packaging industry, and PackComp business units in particular, rests on two considerations. First, an ongoing research collaboration with PackComp enabled access to the organization and allowed researchers to use the knowledge of corporate level managers when evaluating and identifying business units suitable for the study. Second, the relatively large number of business units within PackComp offered an opportunity to study wide variety of pricing strategies while keeping technology and industry constant. The primary reason for this variety was the geographically decentralized organizational structure of PackComp with independently operating business units that in many cases had been recently acquired from other companies within the industry.

Cases in a multiple case study design should ideally be replicated so that they either produce similar results for predictable reasons (literal replication), or contrary results, for predictable reasons (theoretical replication) (Yin, 2003). Explorative interviews with corporate level managers within PackComp played an important role for identifying suitable cases. The replication logic used in the study built on identifying cases pursuing different pricing strategies where these differences could be explained in terms of differences in individuals, assets and routines (i.e., theoretical replication). In the first explorative interview with the sales and marketing director of central Europe, OppCo was brought forth as a candidate to be included in the study. The reason for this was the unit's value-based approach to pricing. CaCo was selected as an example of business unit that successfully pursued cost-plus profit pricing with a strong focus on capacity utilization and operational efficiency. A second round of explorative interviews was made at PackComp's European headquarters with the European finance director. Based on recommendations, PremCo was selected as an example of a business unit offering more differentiated products based on market-oriented pricing strategy. Once the cases had been selected, contacts with each business unit were established via e-mail to set up a visit and schedule interviews with suitable respondents at the local site.

3.3. Data collection procedures

The business units were located in three different countries across middle/central Europe. The data collection for each case was conducted during a two to four day visit to each site. All the case studies were conducted according to a pre-defined case-study protocol that specified data collection procedures, data sources (interviews, documents, etc.), and the type of questions that the collected data should answer (Yin, 2003). This protocol (see Appendix 1) was originally developed in a generic format based on relevant theoretical concepts and contextual factors, and then continually adapted to better fit the individual cases and insights gained in previously conducted cases. This assured that data collected would be exhaustive relative to theoretical concepts and other potentially important emergent categories, and would remain consistent throughout the study.

A total of 26 semi-structured interviews were conducted during approximately a one-year period. The interviews were conducted at each site and ranged between 1 and 4 h. Table 1 describes the different interview sessions and the position/gender/age of the respondents. The aim of the selected data collection procedure was to build case-based conclusions based on many different data sources. This allowed evidence collected from one data source (such as an interview) to be verified by a second source (such as a second interview with a different respondent) or by a completely different medium (such as documents). Individual respondents were selected together with a representative of the local management team because of their specific insights and involvement in the pricing process. A key priority when selecting respondents was to gain a wide range of different perspectives on the pricing process so that both top management strategy as well as the more day-to-day concerns of the sales reps would be captured in the interviews.

Documents were used to raise new issues related to the items in the case study protocol and for verifying, or complementing, data collected from interviews. Financial and other types of quantitative data (profit/loss statement, market reports, etc.) played an important role in verifying and complementing more tangible forms of information given by the respondents.

3.4. Data analysis

Data analysis procedures were based on two types of methodology literature: case study research (Eisenhardt, 1989; Yin, 2003) and the method of constant comparison (Glaser & Strauss, 1967; Strauss & Corbin, 1998). The interviews were first transcribed. All transcripts were then read through several times while noting themes identified in the text on a separate piece of paper and marking the text in the transcript that the particular theme referred to. By iterative comparison of the text sorted under different themes, the number of themes was reduced and individual themes were delimited so that a consistent

Table 1
Cases, respondents, and interview sessions.

Phase/case	Interview sessions (position, gender, age)	Respondents	Interviews
Explorative	Regional sales & marketing director (male > 50) Regional sales & marketing director (male > 50) Corporate finance director (male > 50) Financial manager (male > 50) Commercial manager (male > 50)	4	5
CaCo	General manager (male > 30) General manager (male > 30) General manager and internal sales manager (female > 40) Internal sales manager (female > 40) External sales manager (male > 40) Controller (male > 40) Internal sales representative (female > 25)	5	7
OppCo	General manager (male > 50) and sales & marketing manager (female > 50) General manager (male > 50) and sales & marketing manager (female > 50) General manager (male > 50) and sales & marketing manager (female > 50) Key account manager 1 (female > 25) Key account manager 2 (female > 25) Lead designer (male > 25)	5	6
PremCo	General manager (male > 50) and sales manager (male > 50) Sales manager (male > 50) Sales manager (male > 50) Sales manager (male > 50) Sales manager (male > 50) Financial manager (male > 50) and Sales manager (male > 50) Internal sales representative 1 (female > 25) Internal sales representative 2 (female > 25)	5	8
Total		19	26

classification was accomplished. Themes were then given definitions that captured the content of the quotations included under the themes. A case-description was then written based on the outlined structure. Each case-description described the case in terms of pricing strategy, pricing activities, organization, mechanisms underlying the pricing decision, product costing, and market intelligence.

Once the individual cases had been written down a comparison was made between the cases in order to identify theoretical patterns. First, each individual case was plotted in terms of pricing strategy and the factors enabling the strategy in question. The empirical patterns from the analysis of individual cases were then summarized and related to each other. The final step in the data analysis involved matching the empirical pattern emerging from the cross-case analysis with prior studies on the choice and implementation of pricing strategy in order to identify the specific theoretical and practical contribution of the study (see Yin (2003) for a description of the data analysis method of pattern-matching).

4. Pricing in the European packaging industry

The results are based on observations in the three studied cases that show how firms in the European packaging industry implement their pricing strategies: Pricing activities associated with a certain pricing strategy represent important components for the implementation of the particular pricing strategy. Similarly, the judgment, assets and routines associated with a certain pricing activity represent important components for the execution of the particular activity.

4.1. CaCo: capacity pricing

> We are comparable and that is the problem. At this moment I have no idea of what I can offer to the customer that the competitors do not offer. We are quite comparable and therefore, as long as you are comparable, the decision maker is price.
>
> (External sales manager)

CaCo is a single plant organization that was incorporated into PackComp in 1997. The plant is located in middle Europe and the history of the unit dates back to 1954. Respondents described CaCo as lacking specific ties or close relationship to any specific niche in the market, which made differentiation more difficult. The fact that CaCo's products were viewed as comparable to competitor offers led CaCo towards a focus on efficiency, capacity utilization, and volume. Hence, the objective of CaCo's pricing strategy was the tactical maximization of volume given capacity constraints on machines (i.e. maximization of contribution/machine hour). The general manager explains.

> At the moment or for the last year we have been improving volume […] Our capacity has also been quite full in that range and we even tried to push it to be able to justify a project to increase our production capacity. That might be wrong from a pricing standpoint because you would say that if you run at an over capacity you should try and get the bad orders out and only focus on the good orders. From a development point of view of where you want to see your factory in five years, for a transport packaging plant, I think that we do not have the volume that we should have as the ideal set up. So, volume growths it very important to be efficient and to fully utilize all the capacity we have. We have a bottleneck in converting, and in the corrugator we are not so booked, so to bring that in balance is a key strategy for the future.
>
> (General manager)

CaCo achieved its pricing objectives by setting prices based on calculated full costs and available capacity on key machines at the time of the order. The cost-based price of the product was then adjusted so that low value-added products were priced with a relatively lower margin to generate a base-contribution on large and capital intensive machines, while more value-added and less comparable products were priced with a relatively higher margin to generate additional profits. Contrary

to the classical notion of cost-plus profit pricing where price is fixed based on full costs and an added margin that corresponds to the desired rate of return, the pricing strategy at CaCo displayed significant flexibility across products and time (as capacity utilization changed). This was accomplished by using different cost-bases and mark-up or mark-down for different types of products, and high responsiveness to customer demands put forward in negotiations.

CaCo's pricing process was characterized by a strong focus on activities related to the costing of incoming orders and customer negotiations. Hence, in the first step, desired levels of overall volume and capacity utilization were achieved by choosing a cost-base that matched the type of product being priced. In the second step, an appropriate mark-up or mark-down on this amount was chosen. This activity was focused on the information delivered by the costing system. Due to the lack of "market input" prior in the process, the customer negotiation functioned as an important instrument for assessing the commercial side of products, thus gaining information on the customer's willingness-to-pay and the competitive pressure associated with particular orders.

Key factors in the pricing process was the product costing system, which provided a fundamental point of reference and source of information for all pricing decisions made at the plant. Even minor details in the design of the costing system played an important role for how pricing was conducted. An example of this was the different cost-bases generated by the system prior to the pricing decision. The fact that the system was able to generate several different cost-bases provided decision-makers with an important form of discretion that could be used to caliber the preliminary pricing decision according to the decision-maker's judgment of the specific situation. Hence, it provided the decision-maker with an additional means for meeting heterogeneous customer demands or adjusting the price to the volume and capacity situation at the time of the decision.

> We know the customers we quote and what we can charge. A gut feeling more than something systematized […] We do not have a system in which we discriminate prices between segments, but on the other hand, from a point of daily business we have a good feeling of what we can charge for […] We have 700 customers and 5000 articles. Within a customer you have 10 references, references which are priced high and low. How do you find the right metric for that? There is sometimes no rational behind it, where one reference is priced high and one low. It is likely due to the fact of competition that the price of one reference has eroded because the buyer put three references on the market and then comes back to you and say: "You lower your price by 10%, or you are out, you decide!". And, you decide to offer it. Then, all of a sudden, you have three references at that customer that are lower priced than the other five. When you look back after a year and do an analysis, you see that there is no rational reason that these references have a lower price than the others.
>
> (General manager)

Other factors that played an important role in the pricing process included the specific commercial organization, pricing authority and incentive controlling arrangements. Common to these elements was that they were used to control the behavior of employees engaged in the preliminary pricing decision and customer negotiations. For example, hidden margins added in the cost calculation system by the management team and the use of sales provisions provided management with tools to control the sales rep's general tendency to reduce initial prices to get the order, while the formal pricing authority provided accountability and ensured that pricing decisions were made by people who were perceived to have the necessary competence and information. Individual commercial experience was a key factor in managing customer negotiations and judging which cost-base, or which mark-up or mark-down, to use for a certain order. The importance of individual and subjective pricing judgments in the pricing process was partly a result of the lack of other systems for assessing the commercial viability of a certain price independent of order costs. However, it also provided a means of achieving flexibility and dealing with complexity in the pricing situation that was hard to achieve with a standardized IT-system or specified rule.

4.2. OppCo: opportunity pricing

> In our business, where service is a bigger part than the material itself, we do not use cost as the basis for price. We use value as the base for price. The value is practically what the customer is willing to pay. The product and the service is value to the customer so that is why we call it value-based pricing and not cost-based pricing. It does not mean that we don't understand costs, we do, but the base of the price is not the costs of production […]. As we do the pricing, it is based on understanding the customer and judging what is the value of our product and service to the customer. For this type of pricing, the most important thing is that we have to make ourselves different from our competitors.
>
> (General manager)

OppCo is a multi-site organization with one box plant, three sheet plants, one production unit for consumer and display packaging and a head office. The unit is located in middle Europe and started as a PackComp "green-field operation" in 1996. OppCo's competitive position was based on a close relationship with the electronics segment, which had created a differentiation opportunity based on the specific requirements of this segment. This enabled OppCo to develop a product portfolio that was not directly comparable to any of its major competitors and hard for customers to benchmark based on price. The fact that the product offer contained extensive service components that were less associated with paper prices and processing costs led away from a traditional efficiency and cost-oriented focus towards a value-based strategy. The main objective of OppCo's pricing strategy was thus price discrimination, which was achieved by setting price in a highly flexible manner according to an assessment of the individual customer's willingness-to-pay in each individual situation. Naturally, this resulted in prices that varied significantly across customers that attributed differential levels of value to the product. The general manager explains.

> Pricing is practically understanding of the market and the business, and based on that trying to get the highest possible added value. Highest possible added value is practically our concept, to go for the best opportunity. To utilize the opportunities on the market, that is the art of pricing. It is more of an art than a technique or software; it is entrepreneurship and sometimes the feeling: "Now I can get a higher added value because the competition was absent, too slow, or they made a mistake".
>
> (General manager)

The pricing process was characterized by a strong focus on activities related to the preparation and logistical routing and team-based discussions leading up to a decision on which added-value to use for pricing an individual order. Hence, desired levels of price discrimination were achieved by exerting significant resources routing each new project to make sure that it was commercially well positioned towards the targeted market segment, and by choosing an added-value that matched the actual level of perceived benefit inherent in the offer. Both these activities were focused on the market viability of the offer, while the role of production costs was downplayed.

Key factors in the pricing process were the commercial experience of the sales and marketing manager and the key account managers together with the organizational set-up, including the use of a key account team organization, and the routinized use of added-value as an important pricing parameter. A striking attribute of OppCo's pricing was the lack of systems. Instead of generating the particular information needed in the pricing decision in an IT-system, such as a costing system, OppCo

relied extensively on the ability of decision-makers to gather information and judge the commercial situation. Correspondingly, the type of control over individual behavior that can be accomplished by tying action to the technical attributes of a system was accomplished with organizational means, such as having all pricing decisions made by a small group of key account managers at one location under the close supervision of the sales and marketing manager. The primary reason for the lack of systemization and the use of IT-systems in the pricing process was the objective of adapting each pricing decision to the specific customer's willingness-to-pay and thus achieving maximum price discrimination. This clearly meant sacrificing elements of formal control and systematized information gathering in favor of individual judgment and commercial experience.

> I think that there is a very big advantage to not have a structured or defined pricing system [i.e. costing software]. That is how we get rid of the commodity approach. If it is a little bit dark for the customer, not a clear structure, a cost break-down with paper, contribution, deprecation... Then it is mechanical, transparent and understandable, that is selling a commodity. If we make it little confusing for the customer, the complexity of the business, the service demand, that and that, then it is not so easy to go for the cost savings and cost attack, and also, it is not so easy for our competitors to understand our way of thinking.
>
> (General manager)

4.3. PremCo: premium pricing

> The challenge is to earn money with the special products, which no competitor is able to produce. For the customer it seems that they have good prices because if he compares the more conventional products with the competitor, everything seems ok, but for the other products he cannot compare. He is not able [because they are unique to PremCo].
>
> (Sales manager)

PremCo is a single plant organization that became part of PackComp in 2002 as a result of an acquisition. PremCo's local industry was characterized by a strong demand for high-end consumer packaging, preprinted packaging, and in-store displays. This demand was driven by large food and confectionary companies, for which packaging was an important part of their products' in-store appearance, thus requiring packaging partners highly accomplished in print and design. PremCo's competitive position was based on a long-term relationship with large brand leaders in the local food and confectionary industries and the specific requirements of these segments. The close relationship with companies in these segments created an opportunity to differentiate the product portfolio based on print and design. The fact that a large share of PremCo's products were relatively unique and not exposed to high levels of competitive pressure led to a focus on preserving this position relative to the targeted customer segments, rather than engaging in short-term actions aimed at cost reductions and capacity utilization. PremCo's pricing strategy was thus aimed at high stable prices and market credibility, which was accomplished by setting prices in a conservative manner using fixed mark-ups on costs. The exact size of individual mark-ups was determined by an assessment of what could be expected to pass for a fair and long-term price for a certain product and customer segment.

> Many prices are driven by the market, so I would say that market accounts for roughly 60% of the [pricing] decision. We have a special situation here in PremCo because our products are not 100% comparable so with my special products, I would say that 80% of the decision is cost-oriented and only a little is market oriented. With the rest of the products [which are comparable and exposed to competitive pressures] I would say that 80% is market and 20% is costs. It depends on the products.
>
> (Sales manager)

The pricing process at PremCo was characterized by a strong focus on the gathering and systemization of technical and commercial information concerning incoming inquiries and the routing and costing of the inquiry. Hence, high stable prices and customer credibility were achieved by exerting significant resources in the initial phase of the pricing process in order to arrive at a valid price. This included gathering extensive market and technical information about the inquiry in a systemized way, creating an optimal routing of the potential order, and setting and running the cost calculation. In this process, information from a post-cost calculation system about historical "real" costs, and the detail of information provided by a special inquiry form provided additional precision in judging the long term viability of a particular price.

Key factors in the pricing process were the sophisticated pre- and post-cost calculation systems and the internal system for registering new inquiries. These provided the detailed information needed to arrive at a valid price early on in the pricing process (in terms of profitability and long-term market acceptance). Hence, the high level of technical sophistication of costing and specification systems reduced the arbitrariness of the information with which the cost-base and mark-up were arrived at. These sharpened the precision of pricing decisions without extensive reliance on the personal judgments of the decision-maker or on the negotiation process.

Other important factors in the pricing process at PremCo included particular incentive controlling arrangements, such as hidden margin in the pre-cost calculation system that were added by the management team, the organization, such as delegated authority in the internal sales department, and a set-up with a separate external sales organization. In general, these factors were important for controlling the actions of individual employees where the parameters generated by the systems did not provide sufficient control, for example, in securing that individual internal sales reps did not reduce prices too much in negotiations. Hence, the incentive controlling arrangements and the organizational structure provided flexibility within certain limits. By having access to precise and correct cost information, but at the same time releasing the information in an inflated form, management was able to remain in control, in terms of regular check-ups and having the authority to substantially lower prices in individual cases, while providing additional incentives for the sales reps to quote higher prices.

Commercial experience and judgment also played an important role in the pricing process. Because of the general lack of systems for gathering and analyzing market information, market assessment was, to a large extent enabled by relying on the individual sales rep's own commercial experience. In a similar way, decisions regarding the size of mark-ups and markdowns were contingent on the commercial experience of the individual sales rep. In activities related to market assessment or judging what mark-up to apply, personal discretion or estimates by the external and internal sales reps were used as a substitute for technical systems.

5. Analysis

The following section analyses cross-case variation in how the studied units implemented their pricing strategy, and compares this empirical pattern with the theoretical pattern described in the theory section. While the cross-case analysis is comprehensive in terms of identifying internal factors that are linked to the implementation of a certain pricing strategy, the primary focus of the analysis is to examine the specific role of micro-foundations. Hence, the second part of the analysis primarily discusses the role that individual judgment, human capital and commercial experience played for the implementation of pricing strategy at the studied units.

5.1. Cross-case analysis: industrial pricing strategy

This study's more process-oriented view of pricing strategy captures how strategies constitute tradeoffs between different economic dimensions, such as price elasticity, capacity utilization, and price discrimination; and how these may be more or less important during different activities in the pricing process. For example, consider CaCo's pricing strategy, which early in the pricing process had a strong orientation towards capacity utilization, but which in later stages of the process (customer negotiations) became more oriented towards gaining market information through customer interaction in order to discriminate prices. Overall, the cross-case analysis showed important differences across the studied units in six different areas: (1) IT-based systems, (2) price parameters, (3) commercial organization, (4) pricing authority, (5) incentive controlling arrangements, and (6) commercial experience.

5.1.1. IT-based systems

Different types of IT-based systems affecting the pricing process were in place at all the studied units. Three types of systems were identified in the study: pre-cost calculation systems, post-cost calculation systems, and systems for registering and handling customer- and inquiry-specific information. The use of IT-systems was associated with all identified activities (evaluation and planning, customer assessment, preliminary pricing decision, and customer negotiations) but played a surprisingly minor role across the studied units in gathering and structuring market information prior to the pricing decision. All units used some form of an IT-supported system for registering incoming inquiries and defining new projects, but the impact and use of these systems when setting the price was limited. However, IT-supported costing systems played a very important role in the preliminary pricing decision at all the studied units except OppCo. The primary role of the systems was to provide the decision-maker with cost information, and a pre-set structure for making the pricing decision, which played an important role in limiting the personal discretion of the decision-maker. IT-based systems also constituted an important means by which CaCo limited personal discretion in the customer negotiations by creating a controlled structure tied to the set-up of the IT-system.

5.1.2. Price parameters

Interestingly, the studied business units utilized different parameters to guide pricing decisions: (1) variable cost, cash-flow zero, full cost, index of coverage of overhead (CaCo); (2) added value (OppCo); and (3) full cost plus/minus X % (PremCo). Price parameters were tightly linked to the type of (or lack of) an IT-based pricing system employed at the different units and played an important role in securing a certain routine approach to the preliminary pricing decision and negotiation that limited individual discretion. The role of the particular pricing parameters was to control the behavior of the decision-maker, rather than providing additional information by suggesting optimal prices. This was illustrated by the fact that; in two out of the three cases (CaCo and PremCo), the information generated by the system was deliberately distorted by the management team to influence how sales reps made pricing decisions.

5.1.3. Commercial organization

Three different types of commercial organizations were identified in the study: (1) Plant-level commercial organization with commercially responsible external sales reps and internal sales reps responsible for administration (CaCo), (2) National commercial organization with key account teams (OppCo), and (3) Plant-level commercial organization with commercially responsible key account teams and separate national external sales organization (PremCo). The types of commercial organizations identified at the different units had important effects on all identified pricing activities. For example, in the case of PremCo, which operated with a separate national sales organization, coordination effects could be observed in terms of more coherent prices and less competitive pricing between different units belonging to the same external sales organization. Hence, the coordination of evaluation and planning at a national level was an important tool for aligning the pricing policies of all units to a single principle that was independent of the individual unit's cost structure and objectives.

The level at which the commercial organization was organized also governed market assessment activities, pricing decisions and customer negotiation at the studied units. At all the units, the most important source of market information was the sales rep's/key account manager's direct customer interaction. In cases where units operated solely with a plant-level commercial organization, the sources of market information were limited to a rather small number of individuals working together with a limited number of customers. On the other hand, in cases where units operated with national sales organizations, sources of market information included a larger number of sales reps and customers. The effects of commercial organization on pricing decisions were most visible when comparing the organizational set-up of PremCo (separate pricing and sales function) with CaCo and OppCo (one pricing and sales function). The separation of the pricing function from sales detached the preliminary pricing decision (and negotiations) from the overall sales process, thus reducing the conflict of interest associated with either gaining turnover/volume or high prices.

5.1.4. Pricing authority

Three different set-ups regarding pricing authority were identified: (1) pricing authority held by a sales and marketing manager (OppCo), (2) pricing authority held by key account managers or internal sales reps (PremCo), and (3) pricing authority held by external sales reps (CaCo). The unit that had the pricing authority delegated down to the sales reps tended to rely more on the customer negotiations for arriving at an acceptable price. Units with a more centralized pricing authority put less weight on customer negotiations, instead relying on the early part of the process to find an acceptable price. Differences in level of pricing authority between units can thus be linked to the relative importance of negotiations for the final pricing decision. This indicates the trade-off between the detailed customer- and situation-specific information that can be gained by relying extensively on the sales rep's personal discretion and the loss of control over individual prices experienced under these circumstances.

5.1.5. Incentive controlling arrangements

The two main forms of incentive controlling arrangements observed at the studied units were sales provision and deliberate restriction of cost information. Sales provisions were awarded external sales reps at CaCo and PremCo. However, the sales provisions generally had limited impact on pricing due to low levels of reimbursement, low correlation to individual performance, and limited in pricing authority (in the case of PremCo). The deliberate restriction of the amount and type of (cost-) information available to the decision-maker played a more important role in controlling the pricing decisions being made at CaCo and PremCo. In the case of CaCo, these arrangements were also complemented by sales provisions for the external sales reps. The incentive controlling arrangements were primarily associated with the preliminary pricing decision and negotiations. By releasing inaccurate and inflated cost information, sales reps were led to believe that the orders were less profitable than they actually were. This arrangement was intended to make decision-makers at lower organizational levels (i.e. sales reps) fight harder to keep price levels up and not accept prices close to the cost of producing the order.

5.1.6. Commercial experience

Individual commercial judgment was present in the pricing process of all studied units. The type of judgment observed across units was built on personal knowledge or experience that had been acquired over a longer time period. The personal experience and skill of

individual employees (mainly sales reps, key account managers, and sales managers) was the single most important element enabling an effective assessment of market factors, the preliminary pricing decision, and negotiations. The extensive reliance on commercial experience was partly a result of the low level of systematization and IT-support in these areas, but also a consequence of the complex situation facing the units when trying to assess relevant market data and the validity of different prices. This difficulty arose from the customized nature of the product being sold, which produced a large number of product types, each with its own specific customer benefits, production costs and logistic solutions to be taken into account when deciding price. Hence, keeping the market assessment and the pricing decisions unstructured and relying on the ability of individual sales reps and managers to judge different commercial situations on their own merit, rather than implementing systematized solutions, was a way for the studied units to manage the uncertainty involved in pricing customized products. However, to the same extent that this practice provided sufficient flexibility in handling the informational aspects of the pricing process, it also introduced severe control issues, which were managed by introducing specific organizational and incentive controlling arrangements.

5.2. Pattern-matching: Individual judgment, assets, and routines

Three important differences in pricing activities were identified when comparing the cases: (1) differences in emphasis on evaluation and planning activities, (2) differences in the reliance on customer assessment or negotiation, and (3) differences in how the preliminary pricing decision was executed. These differences were the result of the units' pricing assets and routines. First, the emphasis on evaluation and planning activities at PremCo was closely tied to the investment in a particular IT-based system (e.g., post-cost calculation system). Second, the reliance on customer assessment (OppCo and PremCo) or negotiation (CaCo) was closely tied to the organizational set-up and level of pricing authority at the different units. Hence, using customer negotiation as a significant tool in the pricing process was made possible by delegating the pricing authority down to the individual judgment of sales reps. On the other hand, units where the pricing authority was held by a central function had to exert more effort earlier in the pricing process to gather sufficient information. Third, the practice of executing pricing decisions under more controlled or routinized circumstances (CaCo and PremCo) was closely tied to the delegation of the pricing authority to lower organizational levels, while units relying on a more centralized pricing authority (OppCo) executed pricing decisions in a more unstructured way with greater personal discretion based on the individual judgment of the decision-maker in question (in this case the sales and marketing manager).

The above results highlight the importance of striking a proper balance between the information processing capacity of humans in the form of individual judgment and commercial experience, and the controlling function of specific routines and organizational structures, and the possibility of replacing both with IT-based systems in situations with high levels of certainty and structure. Relative prior studies on the organization of pricing this study stands out by pointing to human capital, individual judgment and commercial experience as potentially more important for a well-functioning pricing process than social- and system capital.

This study shows that industrial pricing environments can be very complex. Driving this complexity is the wide range of products, customers, and commercial terms. Hence, compared to prior studies on pricing strategy (e.g., Noble & Gruca, 1999; Tellis, 1986) and pricing capability (e.g., Dutta et al., 2003; Zbaracki & Bergen, 2010) this study points to an informational aspect of pricing strategy related to categorizing, aggregating and disseminating commercial information. The studied units used a mix of two types of methods for addressing this uncertainty: One method involved relying on the individual judgment of commercially experienced pricing experts in the preliminary pricing decision to arrive at a price (OppCo). Another method involved relying on the sales reps and extensive customer negotiations to collect information and reduce uncertainty (CaCo). Both these methods for handling uncertainty indicate that individual-level characteristics, the commercial experience of the people involved, and ultimately their heterogeneous commercial judgment, constitute significant micro-foundations of industrial pricing strategy. Hence, in addition to the notion that firm-level factors, such as the choice of pricing method (value-based, cost-based, competitor-based, etc.) and the design of the pricing organization, drive performance variation in pricing, the results indicate a possible alternative hypothesis, namely, that individual-level differences across pricing experts and sales reps engaged in the pricing process play a key role in whether firms are successful in implementing their pricing strategies. This directly matches the notion of individual-level functional heuristics gained through extensive commercial experience in situations with a specific decision-structure (see Brighton & Gigerenzer, 2015). In the words of the general manager at OppCo who strongly advocated this view of pricing, to "utilize the opportunities on the market, that is the art of pricing. It is more of an art than a technique or software; it is entrepreneurship and sometimes the feeling: 'Now I can get a higher added value because the competition was absent, too slow, or they made a mistake'."

The above results concerning the role of individual judgment in the implementation of pricing policy also gives a slightly different interpretation of the role of pricing assets and routines, and the mechanism that link these with performance. While prior studies on pricing capability (e.g., Dutta et al., 2003) take the position that firms invest in pricing assets and routines primarily to solve social coordination problems where individual-level heterogeneity is in the background, this study points to the effect that assets and routines may have on individual judgment and the role they play as decision-supporting systems (e.g., Kahneman, 2003). For example, the studied cases illustrate how management selects pricing parameters to be used in the pricing process in order to anchor individual-level judgments at a certain reference point (e.g., the choice of "added value" as a reference point at OppCo and the use of price parameters such as "cash-flow zero" at CaCo). Similarly, the incentive controlling arrangements of adding a hidden margin in the cost calculation (see CaCo and PremCo) can be interpreted as an attempt to influence decision-makers' perception of prices relative the risk of financial losses (i.e., loss aversion, see Raghubir, 2006). While these are only examples, they point to exiting research opportunities investigating how institutional arrangement is related to cognitive and emotional biases in pricing decisions.

6. Concluding discussion

6.1. Research implications

The three cases analyzed in this paper all represent quite typical industrial pricing-settings where products are partly adapted to fit individual customer requirements and prices are in turn negotiated as a result of the order-specific variations. While these conditions are to some extent consistent with the empirical setting of Dutta et al.'s (2003) case study, they depart from Tellis (1986) and Noble and Gruca (1999) where prices seemed heavily influenced by list prices. The presence of order level variation and per sale pricing in the three cases offers an opportunity to gain novel insights into the relevant dimensions of industrial pricing strategy and the specific assets and routines firms require in order to successfully execute industrial pricing strategy. The contribution of the study is threefold:

First, the results of the study indicate that prior studies in the area of pricing strategy, and industrial pricing strategy in particular, have not placed sufficient weight on individual judgment, negotiation and commercial experience as important factors influencing pricing decisions (e.g., Noble & Gruca, 1999; Tellis, 1986). While the presence of

individual judgment, negotiation and bargaining in the pricing process is not necessarily desirable, it may under certain conditions (high uncertainty, product customization) be the only available method to achieve price discrimination when customers exhibit differential willingness-to-pay. When this happens, firms need to adapt their internal pricing organization so that they are successful in customer negotiations. Specifically, the firm faces an unstructured information problem related to assessing the customer's willingness-to-pay that is hard to program and therefore best handled by individual judgment. In the studied cases this included investment in a decentralized organization and commercially experienced pricing experts.

Second, the results of the study indicate that prior studies on pricing strategy do not emphasize organizational control enough (e.g., Forman & Hunt, 2005; Hinterhuber, 2004; Liozu & Hinterhuber, 2013). As illustrated by the three cases, whether a firm's pricing strategy builds on price discrimination or capacity utilization on key machines, pricing may require a level of flexibility that is hard to accomplish without delegating pricing authority to individual sales reps or key account managers. When pricing authority is delegated in this manner, controlling the relevant incentives and the discretion of the decision-maker becomes very important for the pricing strategy to succeed (see Hallberg & Andersson, 2013). As illustrated by the three cases, the required level of organizational control may be accomplished in many different ways: tying the pricing routine to an IT-system with a fixed procedure, adding secret margins into the costing system, tight supervision and group-based decisions, performance pay, etc. Structuring the decision-environment in such a way that individual judgment is affected in a specific direction may be an underappreciated but powerful way to control pricing decisions.

Third, the results of the study indicate that prior studies on pricing strategy do not sufficiently highlight the challenges firms face related to the aggregation and dissemination of market information and thus the difficult task of coordinating pricing activities when conditions are customer-specific and the number of articles is high (up to 5000 in the studied cases). Many studies of pricing strategy, as well as normative literature, seem to operate under a (more or less strong) list price assumption that seriously underestimates the challenges associated with the aggregation and distribution of relevant market information across the organization (e.g., Nagle & Holden, 2002; Noble & Gruca, 1999; Tellis, 1986).

The results of this study may in addition to the above implications be seen as extending the findings of Dutta et al. (2003) by highlighting differences and similarities in pricing assets and routines across industries, countries, and firms pursuing different strategies. The results also outline the relationship between a set of enabling factors, and a particular pricing strategy. Expanding our understanding of how specific assets and routines affect *pricing* strategy, and ultimately firm performance, is of particular importance since established explanations of firm performance, such as the resource-based view, give limited attention to this issue (see Barney, 1991).

6.2. Managerial and practical implications

The results of the study shows that firms commit to different configurations of assets, routines, and activities to enable the implementation of pricing policies related to price discrimination, price elasticity leverage and operating leverage. Based on the results of the study, the following recommendations are proffered to managers engaged in the evaluation and development of industrial pricing strategy:

6.2.1. Invest in human capital

Commercial experience and human capital is, among other things, a key driver of successful price discrimination in industrial markets. Well-trained human judgment is the only resource with sufficient information processing capacity to handle the uncertainty and complexity that arises in markets with a large number of articles, customized orders, and per-sale customer negotiations. Successful industrial pricing is in many cases still very dependent on “pricing gurus”.

6.2.2. Don't get lost in the analytics

Effective industrial pricing strategy is more about hiring the right people and organizational design than getting the analytics precisely right. It is better to successfully implement a pricing strategy that is slightly off target than to fail in the implementation of a pricing strategy that might seem correct from an analytical standpoint. The choice and implementation of pricing strategy may be severely restricted by the firm-specific assets and routines that are in place. Hence, in order to succeed in pricing strategy, firms need to assess their strengths and weaknesses and base their choice of pricing strategy on how a particular strategy fits internal firm attributes.

6.2.3. Strike a proper balance between information processing capacity and organizational control in your pricing

The implementation of pricing strategy requires a mix of commercial experience, organization, and IT-systems. Whereas commercial experience is an efficient way to collect, filter and interpret customer specific information when the goal is price discrimination, IT-systems and formalized commercial organization play a crucial role for securing that decentralized decision-making doesn't get out of hand, and that information is properly aggregated and disseminated to all relevant decision-makers. Pricing strategy rests on three legs: human capital (for information processing in unstructured situations), organization (to allow for aggregation and distribution of information and control over employees), and IT-systems (a more cost-effective alternative to humans and organizational solutions when the environment is structured and decisions can be programed).

6.3. Conclusion

This study shows that different types of factors enable different pricing strategies. The factors shown to be of particular importance for the implementation of pricing strategy in industrial markets include the judgment and commercial experience of key factors in the pricing process. In addition, several novel relationships are highlighted: First, this study indicates that human capital, specifically in the form of individual judgment and commercial experience, is an important determinant of successful price discrimination in industrial markets. Second, this study indicates that the setup and design of the commercial organization is an important determinant of successful price elasticity leverage (e.g., premium price strategies). Third and finally, this study also indicates that the detail of product costing information (e.g., product costing IT-systems) is an important factor influencing the extent to which firms are able to achieve operating leverage and implement pricing strategies related to a cost advantage (e.g., low-price supplier strategies). Overall, the results show that the implementation of pricing strategy is severely restricted by the individual attributes and judgment of decision-makers and the particular assets and routines that a firm has in place.

6.4. Limitations

The present study is based on observations in three cases limited to a single pan-European industry. Naturally, this limits how the results of the study can be generalized to other industries and settings. Given the study's focus on industrial- or B2B pricing, these limitations primarily concern other industries with limited customization and order-specific adaptations in the product/service and other commercial conditions. In such settings, the need to adapt and negotiate prices is less and firms can to a greater extent rely on periodically updated list prices. Among other things, this reduces uncertainty and complexity and thus reduces the requirement of having extensive human capital in place since many of the decisions can be programed and structured in IT-systems and manuals. A further result of these industry differences

is that decision-settings that rely less on human judgment and discretion and more on IT-systems and strictly systemized approaches is of course less vulnerable to opportunistic behavior and thus less dependent on arrangements that secure organizational control (which are emphasized in this study).

Appendix 1. Case study protocol

Pricing strategy

- What is the desired and actual outcome from the pricing process?
  - o Price discrimination
  - o Price elasticity leverage
  - o Operating leverage

Pricing process

- What are the most important pricing activities?
  - o Pricing policy development
  - o Demand analysis
  - o Cost and profitability analysis
  - o Competitor intelligence
  - o Communication and negotiation

Pricing assets

- What role does human capital play in the pricing process?
- What role does systems capital play in the pricing process?
- What role does social capital play in the pricing process

References

Abell, P., Felin, T., & Foss, N. (2008). Building micro-foundations for the routines, capabilities, and performance links. *Managerial and Decision Economics*, *29*, 489–502.

Amit, R., & Schoemaker, P. J. H. (1993). Strategic assets and organizational rent. *Strategic Management Journal*, *14*, 33–46.

Andersson, L. (2013). *Pricing capability development and its antecedents.* Lund University.

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17*, 99–120.

Bergen, M., Ritson, M., Dutta, S., Levy, D., & Zbaracki, M. J. (2003). Shattering the myth of costless price changes. *European Management Review*, *21*, 663–669.

Blinder, A. S., Elie, R. D., Canetti, D. E. L., & Rudd, J. B. (1998). *Asking about prices: A new approach to understanding price stickiness.* New York: Russell Sage Foundation.

Brighton, H., & Gigerenzer, G. (2015). The bias bias. *Journal of Business Research*, *68*, 1772–1784.

Dierickx, I., & Cool, K. (1989). Asset stock accumulation and sustainability of competitive advantage. *Management Science*, *35*, 1504–1511.

Dutta, S., Zbaracki, M. J., & Bergen, M. (2003). Pricing process as a capability: A resource-based perspective. *Strategic Management Journal*, *24*, 615–630.

Eisenhardt, K. (1989). Building theories from case study research. *The Academy of Management Review*, *14*, 532–550.

Felin, T., & Foss, N. J. (2005). Strategic organization: A field in search of micro-foundations. *Strategic Organization*, *3*, 441–455.

Forman, H., & Hunt, J. M. (2005). Managing the influence of internal and external determinants on international pricing strategies. *Industrial Marketing Management*, *34*, 133–146.

Foss, N. J., & Hallberg, N. L. (2015). How symmetrical assumptions advance strategic management research. *Strategic Management Journal*, *35*, 903–913.

Foss, N. J., & Klein, P. G. (2012). *Organizing entrepreneurial judgment.* Cambridge University Press.

Gigerenzer, G. (1991). How to make cognitive illusions disappear: Beyond "heuristics and biases". *European Review of Social Psychology*, *2*, 83–115.

Gigerenzer, G., & Hoffrage, U. (1995). How to improve Bayesian reasoning without instruction: Frequency formats. *Psychological Review*, *102*, 684–704.

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research.* Chicago: Aldine publishing company.

Goldstein, D. G., & Gigerenzer, G. (2002). Models of ecological rationality: The recognition heuristic. *Psychological Review*, *109*, 75–90.

Hallberg, N. L. (2008). *Pricing capability and its strategic dimensions.* Lund Business Press.

Hallberg, N. L. (2015). Uncertainty, judgment, and the theory of the firm. *Journal of Institutional Economics*, *11*, 623–650.

Hallberg, N. L., & Andersson, L. (2013). Organizational barriers and the implementation of customer value map analysis: A case study of a global manufacturing firm in the polymer technology industry. In A. Hinterhuber, & S. Liozu (Eds.), *Innovation in pricing: Contemporary theories and best practices.* Routledge.

Hinterhuber, A. (2004). Towards value-based pricing: An integrative framework for decision making. *Industrial Marketing Management*, *33*, 765–778.

Hinterhuber, A. (2008a). Customer value-based pricing strategies: Why companies resist. *Journal of Business Strategy*, *29*, 41–50.

Hinterhuber, A. (2008b). Value delivery and value-based pricing in industrial markets. *Advances in Business Marketing and Purchasing*, *14*, 381–448.

Ingenbleek, P. T. M., & van der Lans, I. A. (2013). Relating price strategies and price-setting practices. *European Journal of Marketing*, *47*, 27–48.

Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist*, *58*, 697–720.

Kahneman, D., & Lovallo, D. (1993). Timid choices and bold forecasts: A cognitive perspective on risk taking. *Management Science*, *39*, 17–31.

Levinthal, D. A. (2011). A behavioral approach to strategy—What's the alternative? *Strategic Management Journal*, *32*, 1517–1523.

Liozu, S. M., & Hinterhuber, A. (2013). Pricing orientation, pricing capabilities, and firm performance. *Management Decision*, *51*, 594–614.

Liozu, S. M., Hinterhuber, A., Boland, R., & Perelli, S. (2012). The conceptualization of value-based pricing in industrial firms. *Journal of Revenue and Pricing Management*, *11*, 12–34.

Mankiw, N. G. (1985). Small menu cost and large business cycles: A macroeconomic model of monopoly. *Quarterly Journal of Economics*, *100*, 529–538.

Mousavi, S., & Kheirandish, R. (2014). Behind and beyond a shared definition of ecological rationality: A functional view of heuristics. *Journal of Business Research*, *67*, 1780–1785.

Nagle, T., & Holden, R. (2002). *The strategy and tactics of pricing – A guide to profitable decision making* (3rd ed.). New Jersey: Prentice Hall.

Noble, P. M., & Gruca, T. S. (1999). Industrial pricing: Theory and managerial practice. *Marketing Science*, *18*, 435–454.

Powell, T. C., Lovallo, D., & Fox, C. R. (2011). Behavioral strategy. *Strategic Management Journal*, *32*, 1369–1386.

Raghubir, P. (2006). An information processing review of the subjective value of money and prices. *Journal of Business Research*, *59*, 1053–1062.

Simon, H. A. (1945). Administrative behavior. *Forth edition, 1997*. New York: The Free Press.

Smith, V. L. (1991). Rational choice: The contrast between economics and psychology. *Journal of Political Economy*, *99*, 877–897.

Smith, V. L. (2003). Constructivist and ecological rationality in economics. *American Economic Review*, *93*, 465–508.

Smith, V. L. (2008). *Rationality in economics: Constructivist and ecological forms.* Cambridge University Press.

Stanovich, K. E., & West, R. F. (2000). Individual differences in reasoning: Implications for the rationality debate? *Behavioral and Brain Sciences*, *23*, 645–726.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research. Techniques and procedures for developing grounded theory.* London: SAGE Publications Ltd.

Tellis, G. J. (1986). Beyond the many faces of price: An integration of pricing strategies. *Journal of Marketing*, *50*, 146–160.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*, 1124–1131.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, *211*, 453–458.

Yin, R. K. (2003). *Case study research. Design and methods* (3rd ed.). Thousand Oaks, California: Sage Publication, Inc.

Zbaracki, M. J. (2007). A sociological view of costs of price adjustment: Contributions from grounded theory methods. *Managerial and Decision Economics*, *28*, 553–567.

Zbaracki, M. J., & Bergen, M. (2010). When truces collapse: A longitudinal study of price-adjustment routines. *Organization Science*, *21*, 955–972.

Zbaracki, M. J., Ritson, M., Levy, D., Dutta, S., & Bergen, M. (2004). Managerial and customer dimensions of the costs of price adjustment: Direct evidence from industrial markets. *The Review of Economics and Statistics*, *86*, 514–533.

Journal of Business Research 76 (2017) 189–200

Contents lists available at ScienceDirect

Journal of Business Research

Retailers' and manufacturers' price-promotion decisions: Intuitive or evidence-based?

Svetlana Bogomolova [a,*], Marietta Szabo [b], Rachel Kennedy [a]

[a] Ehrenberg-Bass Institute for Marketing Science, Business School, University of South Australia, Adelaide, Australia
[b] Communicado Pty LTD, Melbourne, Australia

ARTICLE INFO

Article history:
Received 24 August 2015
Received in revised form 19 February 2016
Accepted 2 May 2016
Available online 11 January 2017

Keywords:
Price promotions
Decision-making
Retailer
Manufacturer
Intuition

ABSTRACT

Consumer price promotions account for more than half of many manufacturers' marketing budgets, and require a significant time investment to manage. Amidst the considerable research on price promotions, little academic attention has been paid to how manufacturers and retailers make price-promotion decisions. Based on in-depth interviews with a broad range of managers, this study investigates factors that influence price-promotion decisions in durable and consumer goods industries. Findings suggest that (1) intuition and untested assumptions are the main inputs into these decisions; (2) practitioners lack solid empirical evidence to guide their actions, and their beliefs are often in stark contrast with academic knowledge about the effectiveness of price promotions; and (3) price promotions are typically not evaluated against the objectives according to which they were justified, impeding appropriate feedback for future decisions. Research priorities are outlined to advance evidence-based decision-making in this area.

1. Introduction

Consumer price promotions occur daily in many types of stores, especially supermarkets (Bogomolova, Dunn, Trinh, Taylor, & Volpe, 2015; Nielsen, 2015; SymphonyIRI Group, 2013). Price promotions are an efficient lever to deliver short-term sales increases (Bijmolt, van Heerde, & Pieters, 2005; Blattberg, Briesch, & Fox, 1995; Blattberg & Neslin, 1990; Neslin, 2002), which are a key performance indicator (KPI) for both manufacturers and retailers (Shankar, Inman, Mantrala, Kelley, & Rizley, 2011). Today, price-promotion expenditures account for more than half of many manufacturers' marketing budgets (Ailawadi, Beauchamp, Donthu, Gauri, & Shankar, 2009; Bolton, Shankar, & Montoya, 2010; Nielsen, 2015). This trend continues despite growing evidence that price promotions have detrimental long-term business effects (Ehrenberg, Hammond, & Goodhardt, 1994; Gedenk, Neslin, & Ailawadi, 2010; Sharp, 2010), including heightened consumer price sensitivity (Kopalle, Mela, & Marsh, 1999; Mela, Jedidi, & Bowman, 1998), decreased brand loyalty (Blattberg & Neslin, 1990; Jedidi, Mela, & Gupta, 1999), and decreased base price elasticity (Ataman, Van Heerde, & Mela, 2010). Understanding why manufacturers and retailers persist with price promotions despite these drawbacks, as well as what factors they consider when negotiating within the manufacturer-retailer power conundrum (Ailawadi, 2001; Shankar et al., 2011), is of considerable interest for industry and academia (Ailawadi et al., 2009).

Current knowledge in this area primarily comes from conceptual frameworks (Ailawadi et al., 2009; Shankar et al., 2011) and proprietary industry studies such as those commissioned by the Promotion Marketing Association (PMA) Shopper Marketing Center of Excellence at Nielsen or the Point of Purchase Advertising Institute (POPAI). These sources point to a potential disparity between manufacturers' and retailers' approaches to decision-making. They also indicate a lack of transparency or common understanding, which could lead to suboptimal decisions. Indeed, recent Nielsen reports have contended that more than 60% of grocery promotions in the U.K. and about 70% in the U.S. are unprofitable (Nielsen, 2015; Nielsen UK, 2015). Without a clear understanding of how manufacturers and retailers approach price-promotion decision-making, the industry will find it difficult to converge toward win-win-win outcomes for manufacturers, retailers and consumers (Shankar et al., 2011).

Furthermore, academic work on broader managerial decision-making in marketing has suggested that excellent prospects exist for improvements in this area, if more research is devoted to understanding how marketing decision makers actually make specific decisions and how to optimize them (Wierenga, 2011). More precise insights into which knowledge is actually used and how, and what the value of this knowledge is, is needed (Wierenga, 2002). Advertising and Promotions (A&P) budgeting research is the one area where concerted efforts have focused on the processes that managers use (or claim to use) to set A&P budgets and why they do so. Despite being framed as A&P research, however, most of the emphasis seems to have been on the advertising

* Corresponding author.
E-mail addresses: Svetlana.Bogomolova@marketingscience.info (S. Bogomolova), szabomaryetta@gmail.com (M. Szabo), Rachel.Kennedy@marketingscience.info (R. Kennedy).

http://dx.doi.org/10.1016/j.jbusres.2016.05.020
0148-2963/

component (e.g., West, Ford, & Farris, 2014), thus leaving a gap to improve price-promotion decision-making knowledge. Descriptive studies are needed here because an understanding of current decision-making can help improve the quality of future marketing decision-making (Van Bruggen & Wierenga, 2010).

In line with this special issue on the micro-foundations of pricing, this article contributes to the area of manufacturers' and retailers' price-promotion decision-making by (1) providing insights on how retailers and manufacturers make price promotion decisions; (2) uncovering managers' beliefs and assumptions that underpin price promotions decisions; (3) examining the degree of alignment between the objectives of running price promotions and how managers evaluate promotion success; (4) comparing the information that underpins promotion decisions with academic knowledge in the domain, and (5) offering explanations for why managers make the decisions they make. The findings identify substantial gaps between industry practice and academic knowledge, suggesting a need for better dissemination of the available evidence and a cultural change towards encouraging evidence-based decision-making. This research also identifies gaps between industry goals and evaluation practices, which hinder feedback to improve future performance.

The article starts with a brief overview of the existing (limited) studies on price-promotion decision-making as well as some of the broader literature on managerial decision-making. Second, this paper describes the research method and data collection procedure. Third, this paper reports the main objectives that managers say they pursue by means of price promotions and considers the findings from academic literature regarding the feasibility of each goal. This paper concludes with a discussion of theoretical and managerial implications, outlining under-researched areas for future research and acknowledging limitations of the study.

2. Background

2.1. Disparity in the priorities of manufacturers and retailers

Researching interactions between manufacturers and retailers regarding price promotions is difficult because of the commercially sensitive nature of these negotiations (Ailawadi et al., 2009). For this reason, knowledge on the topic is either scarce or requires further validation. For example, Howard and Morgenroth (1968) developed a model of a price-decision process based on the decisions of just one executive. A more recent conceptual framework proposed by Ailawadi et al. (2009) indicates a potential difference in the priorities that manufacturers and retailers might pursue: manufacturers aim to maximize profits for their brands and company, whereas retailers aim to maximize store, category, and private-label profits as well as shopper satisfaction. Ailawadi et al. contended that these different end goals translate into disparities in the tools and measures used to judge a price promotion's success. Whereas manufacturers use market share, margin, ROI, and brand equity, retailers focus on store traffic, sales per square foot, store share and profits, and shopper satisfaction. The differing perspectives hinder communication and trust between the two parties rather than building harmony to achieve common goals. Cognitive-appraisal theory (Lazarus, 1991; West et al., 2014; White, Varadarajan, & Dacin, 2003) recognizes that the interpretation of the same event (here a price-promotion negotiation) is modified by the assessment of how the event affects the individual, with different cognitive styles and organizational cultures influencing how individuals interpret the same situation.

Ailawadi et al. (2009) concluded there is a "sore need for research on the impact of trade promotions negotiations and post-audit activity on the relationships between manufacturers and retailers" (p.46). In a more recent review, Shankar et al. (2011) highlighted the importance yet scarcity of research into manufacturer and retailer price-promotion decision-making, describing in their article just one relevant source: the industry surveys by the Promotion Marketing Association (PMA) Shopper Marketing Center of Excellence with Nielsen Business Media in 2009. That proprietary survey of 318 retailers, manufacturers, and agencies documented the disparity between retailers' and manufacturers' objectives and KPIs in setting and evaluating price promotions. The study hinted at a mismatch in price-promotion scheduling and reported that only a minority of both manufacturers and retailers are satisfied with their relationships with their counterparts. Shankar et al. (2011) concluded their review with a call for more research into the price-promotion negotiations between manufacturers and retailers in order to improve collaboration between the parties and achieve mutually beneficial outcomes for manufacturers, retailers, and consumers. The present research responds to this call.

2.2. Human factors vs. evidence-based managerial decisions

Substantial research in the management and marketing literature has demonstrated that business decision makers often favor intuitive styles over technocratic or fact-driven approaches (Covin, Slevin, & Heeley, 2001). Meaning that soft factors, such as managers' beliefs, knowledge, cognitive biases, personal factors such as the gender and professional experience of the individuals involved (Duke, 1998), and levels of trust and mutual dependence in personal relationships with business partners (Vermillion, Lassar, & Winsor, 2002; Zippel, Wilkinson, & Vogler, 2013) play a significant role in managers' decisions.

Furthermore, the literature highlights that the information underpinning decisions is often incomplete, rather than objective or evidence-based, and comes from personal experience or conventional wisdom. Past research has also shown that time pressure (Thomas, Esper, & Stank, 2010) and the cost of obtaining further information (Azar, 2014) could prevent managers from using objective evidence and robust data to support decision-making. Moreover, a firm's level of technological advancement can impact the quality of data underpinning managerial decision-making (Covin et al., 2001).

With specific reference to pricing decisions, prior research has found that managers use short-cuts or heuristics, as suggested by the bounded rationality framework (Gigerenzer, 2004; Kahneman, 2003, 2011). A recent study examining managerial decisions about regular (non-promotional) prices showed that 'passivity' or keeping the prices constant was the prime strategy of UK and US retailers (Watson, Wood, & Fernie, 2015); this is consistent with the 'default' heuristic (Kahneman, 2011). As retailers grow in size and influence, retailer pressure will continue to influence these decisions (Low & Mohr, 2000).

In discussing heuristics used in budgeting, West et al. (2014) identifies two types of behaviors that are relevant to price-promotion decision-making: (1) isomorphic behavior (colloquially known as tit for tat), which involves cooperating, keeping a memory of the outcome, and then imitating the partner's last behavior (in this context the retailer or manufacturer as partners); and (2) isomorphic (imitation) behavior, which transpires either by examining the majority or looking at the most successful examples and following them (in this context copying competitors, both for manufacturers and retailers).

However, the use of heuristics in pricing decision-making could result in inferior policies, such as overpricing and product quality–price incongruences, which could lead in turn to consumer rejection (Rusetski, 2014). The use of heuristics in managerial decisions regarding media budgeting can lead to poor decisions, such as overspending (West & Crouch, 2007; West et al., 2014; West, Prendergast, & Shi, 2015; West & Prendergast, 2009). In contrast, the use of heuristics in forecasting decisions can result in improved predictions, where those heuristics are evidence-based (Armstrong, Green, & Graefe, 2015; Green & Armstrong, 2015).

Given the frequently large gap between the inputs into managerial decisions and evidence-based information, the present research pursues the following objectives: (1) to document the beliefs and assumptions that underpin manufacturer and retailer managers' price promotions decisions; (2) to assess the alignment between the objectives of running price promotions and the methods used to evaluate

success; (3) to compare the beliefs and assumptions that underpin promotion decisions with evidence-based academic knowledge; and (4) hence start to better understand the reasons underpinning managerial decisions about price promotions.

3. Research method

This study aims to investigate and describe a relatively underdeveloped area of knowledge about price-promotion decision-making practices. The research problem calls initially for an exploratory interpretive approach using qualitative data (Denzin & Lincoln, 2005; Morse, 1991). This study uses a multiple-methods approach that combines in-depth expert interviews with an independent assessment of relevant written documents. Such an approach aims to strengthen the validity and reliability of the findings through methodological triangulation, as well as data and investigator triangulation, as recommended by Denzin (1970).

The authors rely on in-depth interviews as the backbone of the research, since this is a flexible technique for obtaining and reporting rich data (Kvale, 1996, p. 33). The topic is commercially sensitive and requires a method that can provide high confidentiality and anonymity for interviewees and the information they share (Robson, 1993; Robson & Foster, 1989). As a complement to and a means of validating the in-depth interviews, the researchers also interviewed three prominent retail industry experts. These elites' superior knowledge of the research problem and their global view contribute an additional dimension to the study, as they are well positioned to share informed opinions and to support their answers with real-life examples.

An independent assessment of a small selection of price-promotion planning and management documents (e.g., reports, manuals, and handbooks) was conducted after the interviews. The document assessment was used to verify the information collected in the interviews, and to identify the similarities and differences between the organizations' written processes related to price-promotion implementation and the actual practices reported by the practitioners.

4. Data collection

The researchers conducted 34 interviews with manufacturer and retailer representatives from European, U.S., and Australian companies. The manufacturers produced a range of goods including both nondurables, like snacks, beverages, frozen food and pet food; and durables such as consumer electronics and home appliances. The retailer sample included: Supermarkets, Chemists, Hypermarkets, a Discounter, and a Health, beauty and wellbeing store. This number of interviewees has been deemed sufficient for research aiming to study opinions in depth, rather than seeking generalizability (Charmaz, 2006; Creswell, 1998) but the researchers acknowledge that further replications within and across samples will be vital especially to advance theory in this space.

Twenty-one of the professionals represented manufacturers of consumer goods, and 13 (including the three elite experts interviewed) were associated with the retail sector. See Tables 1 and 2 for the breakdown of interviewees by company and area of responsibility. Within each category, interviews were sought with professionals across a variety of positions and seniority levels. The positions held by the interviewees employed by manufacturers ranged from top-level (e.g., marketing director, sales director) to entry-level (e.g., brand manager, advertising and promotional manager). Interviewees from the retail industry also held a range of positions, from top-level (e.g., procurement director) to medium-level (e.g., category manager) to entry-level (e.g., marketing assistant). This diversity provided different perspectives on the process.

The sample was slightly skewed toward those with greater experience due to the interest in probing decision-making, as were the three elite interviewees who were global experts with more than 85 years of retail experience between then. They were recruited based on the recommendation of a high-profile participant and their expertise verified through industry awards and their resumes. It would have been very difficult to gain access to these experts without the personal recommendation (Harvey, 2010). As prominent representatives of the industry, their engagements were broad. Between them, they had regular contributions to books, articles (trade and academic), industry conferences and blogs, consultancy projects, and case studies.

Table 1
Companies by category.

Company type	Product category/type	N	Region	Size of companies
Manufacturer	*Nondurables*			
	Food products—pet food	3	UK, AU	M, L
	Food products—convenience	2	US, EU	L
	Food products—confectionary			
	Food products—non-alcoholic bev.	2	EU, US	L
	Food products—frozen food	2	EU	S, L
	Durables			
	Consumer electronics	1	EU	L
	Kitchen and home appliances	2	EU, CEE	M, L
		1	EU	S
Retailer	Supermarket	2	AU, EU	L
	Pharmacy	2	AU	S, M
	Hypermarket	1	EU	L
	Discounter	1	EU	L
	Health & beauty	1	EU	M
	Others (consultant and elites)	4	US, EU, AU	S, M, L
Total		24		

S = small, M = medium, L = large;
EU = European Union, UK = the United Kingdom, CEE = Central Eastern Europe, AU = Australasia, US = the United States.

4.1. In-depth interviewing

The participants in the in-depth interviewing phase shared their thoughts on price-promotion decisions from their own perspective, the information (e.g., seasonality, stock available) considered when planning promotional activities, and other factors (e.g., business objectives, personal motivation) that can influence the company's price-promotion decisions. The researchers identified the terminology used by the initial interviewees and built a coding guide, which covered the range of responses provided and was used to facilitate efficient extraction of results from the remainder of the interviews.

Table 2
Number of respondents by area of responsibility.

Company type	Area	Number of respondents ($N = 34$)
Manufacturer	Marketing/brand management	9
	Sales	4
	Research	3
	Advertising and promotion	1
	Sales and marketing	1
	Trade	1
	General management	1
	Service and finance	1
Retailer	Marketing	2
	Procurement/buying	2
	Store management	2
	Promotion	1
	Category management	1
	Customer service	1
	Others (consultant and elites)	4
Total		**34**

4.2. Document assessment

The researchers collected three documents during the research process: two from the same global manufacturer but from different countries, and one from a retailer. The first document was a summary report of reliable historical research (covering 40 years) that included key findings from internal sales data analysis and various research projects conducted in the retail environment by independent research agencies. The second document was a promotional manual that detailed the types of price promotions, the restrictions and exceptions related to promotions, and the key constraints that might lead to different promotional mechanics. The third document was a retail buyers' handbook that contained four sections: pricing and promotions, category management, corporate policies regarding the suppliers, and evaluation of promotions.

4.3. Expert interviews and validation of findings

In the final stage, the three elite experts read the draft research results and critiqued the findings. Drawing on their broad expertise in areas including category management, retail technology, retail management, trade-promotion optimization, and price and assortment optimization they helped interpret and consolidate the contributions. Fig. 1 illustrates how the combination of these multiple data sources resulted in effective triangulation.

5. Data analysis

Given the exploratory nature of the study and the qualitative data accumulated, the analysis involved an inductive method (Patton, 2002). To move from data collection to findings, the following guidelines and steps for qualitative analysis were undertaken to identify the range of patterns in decision-making related to price promotions (Marshall & Rossman, 2011; Patton, 2002).

5.1. Organizing the data

Interviews were transcribed verbatim, and the lead researcher checked transcripts for accuracy and completeness. All interviewees were asked to approve their transcripts or summaries and were invited to alter or update their information (e.g., by adding further thoughts or revising their comments) as a form of quality assurance, in line with the procedure known as member checking (Bloor, 1997; Emerson & Pollner, 1988; Lincoln & Guba, 1985, pp. 239–240).

5.2. Generating categories and themes and coding the data

In the initial stage of the coding process, open coding was used to place the data into preliminary categories (Neuman, 2006, p. 461).

The recorded interviews were then coded using these keywords to enable systematic amalgamation of the relevant data such that no key ideas were lost or under-represented. To ensure reliability of the classifications and minimize potential interpretation bias (Neuman, 2006), two independent coders classified the data. After a pilot phase, the initial codes were revised to ensure they reflected the range of answers that were being provided. With input from the whole team, codes were modified and overlapping categories were reduced to produce the final classifications list that was more mutually exclusive, comprehensive and clear.

6. Findings

The researchers follow the approach adopted by Bucklin and Gupta (1999) in their qualitative investigation with marketing professionals and analyze the key themes from the perspective of the managers' beliefs in comparison to existing academic knowledge, thereby identifying priority future research agenda items. The first finding outlines manufacturers' and retailers' five major objectives for conducting price promotions and their associated beliefs. Under each objective, the analysis highlights similarities and differences between the manufacturers' and retailers' perspectives, using illustrative quotations. Then,

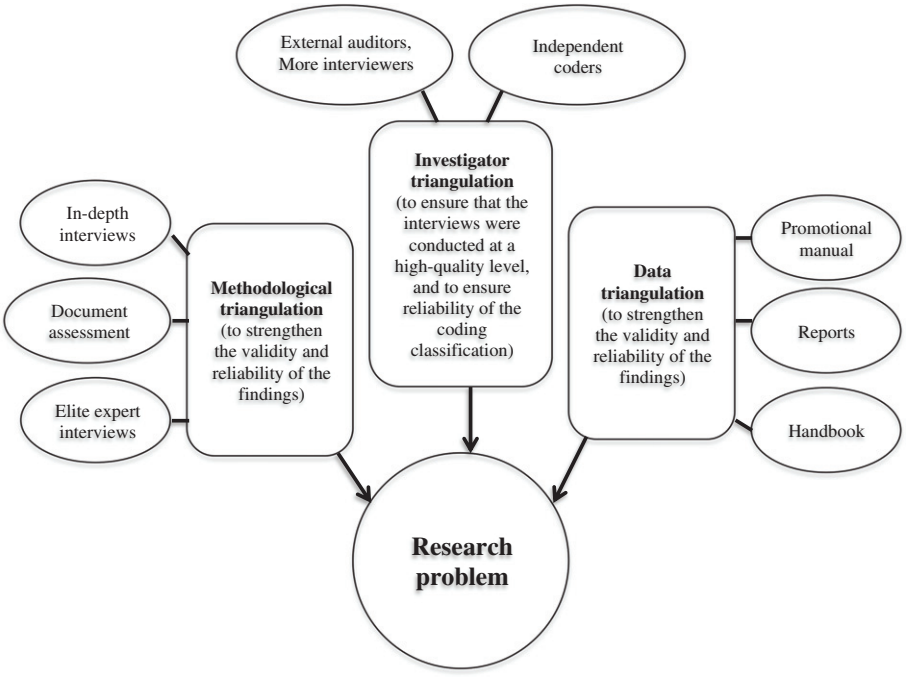


Fig. 1. Triangulation.

the researchers outline what empirical evidence exists within the respective organizations regarding each objective (to identify the degree to which each objective is based on subjective beliefs or empirical data). The subsection on each objective offers a brief overview of the current academic knowledge, outlining any gaps between the industry practice and the prior academic findings. The results section concludes with a discussion of the gaps between the objectives of price promotions and existing evaluation schemes and data sources, focusing on suggestions for how to improve the level of evidence-based decision-making in practice. Table 3 summarizes the key findings concerning the objectives, beliefs, and available academic evidence.

6.1. The role of price promotions in delivering short-term sales uplift

Most manufacturer experts stated that the brands for which they were responsible had undertaken price-promotion activities almost every week or at least two to three times per month across their distribution channels in the previous 12 months. With only one exception, all interviewees from the retail industry also noted that they had participated in 52 weeks of promotional activities in the past 12 months (meaning they ran price-promotion campaigns every week). Both the manufacturers and the retailers justified their heavy promotional schedule with the belief that price promotions were compulsory as they were the only activities that generated immediate impact on sales volume, especially in a tough economic climate. The following comments illustrate this view:

- "No other activity can move such a volume in a short term." [(Manufacturer, medium-tier role)]
- "There's nothing else that can drive volume. Only price promotions." [(Manufacturer, top-tier role)]
- "Price promotion is the one thing that generates sales and leads the market." [(Retailer, top-tier role)]

The assessment of the internal documents confirmed the managers' focus on short-term sales uplift as the key reporting mechanism, as well as the primary input into future planning of price promotions. Managers commonly used sales targets as KPIs to evaluate the performance of a brand, category, or store as well as that of individual managers.

Academic studies in this area do indeed offer overwhelming evidence that price promotions deliver short-term sales bumps (for review see, Bijmolt et al., 2005; Blattberg et al., 1995; Gedenk et al., 2010). The resulting sales uplift can range from very few to a few hundred percentage points, and varies dramatically across categories. However, price promotions rarely have long-term effects on sales, as a promotion period is usually followed by a dip or plateau (Ehrenberg et al., 1994; Nijs, Dekimpe, Steenkamp, & Hanssens, 2001). Price promotions can also increase consumer price sensitivity (Kopalle et al., 1999; Mela, Jedidi, et al., 1998), decrease brand loyalty (Blattberg & Neslin, 1990; Jedidi et al., 1999), and decrease base price elasticity (Ataman et al., 2010). These findings indicate that pursuing a short-term sales uplift is a viable goal for managers, but that achieving this goal seems detrimental for the long-term health of a manufacturer's brand (Lodish & Mela, 2007). From the retailer's perspective, although the immediate effect of price promotions delivers the desired sales volume uplift, net revenues are reduced by price promotions, even when accounting for cross-category and store-traffic effects (Srinivasan, Pauwels, Hanssens, & Dekimpe, 2004). This suggests that, even in the short term, price promotions are not profitable to retailers, and hence retailers must demand slotting allowances from manufacturers to offset those losses (Ailawadi, 2001; Ailawadi et al., 2009).

6.2. The role of price promotions in relationship building

Commonly accepted in the industry, the power balance between manufacturers and retailers has shifted dramatically in past decades in favor of retailers (Ailawadi, 2001; Kahn & McAlister, 1997). Manufacturers thus feel that they are in a weaker position in negotiations, and their objectives for running price promotions often revolve around keeping the retailers happy so as to maintain good relationships. The researchers observed this attitude frequently during the interviews with manufacturers:

- "Well, actually, we use price promotions to maintain a good relationship with [retailers]. … And we have to serve our trade partners … to achieve their CGM [category of margin] targets." [(Manufacturer, top-tier role)]

Manufacturers saw price promotions as one of the few mechanisms, if not the only one, available to persuade retailers to stock or promote their brands, especially new entrants to the market. This belief could often lead to risky or incorrect decisions such as offering a reduced introductory price before setting the regular price:

- "The better the relationship, the more likely the retailer trusts me, so I can easily convince him to promote the new product … it's a risk to us and not to them."

Table 3
Summary of key beliefs regarding objectives of price promotions.

Key belief about price promotions	Manufacturers	Retailers	Consistency with academic knowledge	Relevant references
Deliver short-term sales	Short-term sales volume focus	Short-term sales volume focus	Supported	Bijmolt et al. (2005), Blattberg et al. (1995), Blattberg & Neslin (1990), Neslin (2002)
Build relationships between manufacturers and retailers	Cooperation, wanting to please the retailer	Competition with manufacturers, demonstration of power	Lack of evidence	Ailawadi et al. (2009), Shankar et al. (2011)
Allow retailers and manufacturers to stay competitive	Reactive copycat practices	Reactive copycat practices	Lack of evidence; suggestion of opposite	Steenkamp et al. (2005)
Win new customers	New brand customers	New store customers, especially exclusive promos or member only	Opposite	Ehrenberg et al. (1994)
Maintain/reward loyalty	Brand loyalty	Store loyalty, especially exclusive promos or member only	Opposite	(e.g., Blattberg & Neslin, 1990; Gedenk & Neslin, 1999; Kopalle et al., 1999); (Sharp & Sharp, 1997); (Gedenk et al., 2010).

[(Manufacturer, medium-tier role)]

- "Being a new brand on the market, the only thing you can persuade a retailer with is the price."
[(Manufacturer, medium-tier role)]

Manufacturers appeared to want to cooperate with retailers and keep them placated by fulfilling their expectations and helping to meet retailers' objectives, often by offering price reductions:

- "They [retailers] want to be treated better than any of their competitors of course."
[(Manufacturer, top-tier role)]

- "Suppliers should invest to help achieve retailers' category targets."
[(Manufacturer, top-tier role)]

On the other hand, retailers placed greater emphasis on competition with manufacturers, demonstrating power, and pursuing their own goals. The theme of mistrust came across very loudly in interviews with retailers:

- "You cannot trust the manufacturers. They swear to God to give you the lowest price based on their pricing policies but I'm sure I will find the product somewhere at a better price the next day."
[(Retailer, medium-tier role)]

- "I'm happy to fight with a supplier on purpose to demonstrate pressure."
[(Retailer, top-tier role)]

The assessment of one retailer's internal document revealed some golden rules for employees to follow when negotiating with manufacturers. Most of the tips refer to competitive or dominant negotiation styles (e.g., "cover each other's backs in a debate against suppliers" or "the more you whine, the more you gain"), rather than collaborative styles often sought by suppliers in manufacturer–retailer interactions. In terms of evaluating the quality of the relationships (as a result of price promotions), the assessment suggests that achievement of this objective is to be evaluated mostly qualitatively, if at all. Between the stated objective – to establish, strengthen, or renegotiate a relationship between manufacturers and retailers – and how this objective is evaluated in practice, has a mismatch.

No academic research has specifically measured the impact of price-promotion negotiations on the quality of manufacturer–retailer relationships. However, conceptual papers, alluding to informal discussions with industry experts (Ailawadi et al., 2009; Shankar et al., 2011), have suggested that price promotions are the core mechanism used by manufacturers to persuade retailers to stock, promote, and increase shelf space for their products. This observation supports the findings. The few studies in the area indicated the difficulties that arise in these negotiations because each party has different goals (Guyt & Gijsbrechts, 2014; Srinivasan et al., 2004), along with the complexity of multi-channel and multi-brand deals that lead each side to suspect the other of giving a better deal to the competition, a situation not conducive to building trust (e.g., Perdue, Day, & Michaels, 1986; Smith & Barclay, 1997).

6.3. The role of price promotions in remaining competitive

Both manufacturer and retailer experts indicated that price promotions were necessary to remain competitive. Both parties considered competitors' activity and prices as the key determinants in planning their own price promotions. The practice appeared to be reactive, with manufacturers and retailers often copying the same price offers or activity displayed by their respective competitors:

- "Everybody is just doing what the other guys are doing."
[(Manufacturer, top-tier role)]

- "Game theory: do something that the competition is doing."
[(Manufacturer, top-tier role)]

- "We cannot compete with other retailers' facings or extra services, the only thing is the price."
[(Retailer, entry-level role)]

From the document assessment, we also observed a lack of systematic evaluation of this objective. By their reactive nature, the price-promotion activities seem to play catch-up rather than being a thoughtfully planned, implemented, and evaluated set of actions.

This observation of reactive or passive activity is consistent with descriptions in the academic literature (Steenkamp, Nijs, Hanssens, & Dekimpe, 2005). Although the predominant reaction to competitor activity is no activity, when a company does choose to react, its activities tend to be retaliatory in nature, often using the same marketing instrument (e.g., promotions against promotions). Contrary to the interviewees' beliefs about the need for price promotions to stay competitive, research findings suggest that the absence of a retaliating reaction to competitor promotion could be a sound business strategy (Steenkamp et al., 2005). This echoes the earlier point regarding the poor long-term outcomes of price promotions for both brands and retailers. Given the lack of planning of price promotions, their poor long-term outcomes are not unexpected. Unsurprisingly, providers are experiencing some exploration of different pricing strategies (e.g. EDLP, Hi-Lo to hybrid pricing). Some hard discounters have recognized the current environment as a market opportunity and successfully pursue the everyday low price strategy (Roy Morgan Research, 2014; Tonkin, 2015).

6.4. The role of price promotions in attracting new customers

The manufacturers and retailers commonly believed that price promotions attract new customers to either a brand or a store. This belief led them to consider attracting new customers as the primary objective or justification of running price promotions:

- "A very good price can win new customers but next time they'd choose the competitor on deal."
[(Manufacturer, medium-tier role)]

"Price promotions attract new customers."

[(Retailer, top-tier role)]

Retailers also believed that price was the principal driver causing customers to visit a store. Since the retailers' overarching objectives are to increase store visits and build a good-value-for-money image, retailers appeared committed to implementing extensive and deep price promotions in the hope of achieving those goals:

- "The prices (promotional and regular shelf) are the key factors in choosing [a store] so the price promotions are extremely important for the company."

[(Retailer, top-tier role)]

Interestingly, despite the overwhelming belief that price promotions bring new customers to the store and brand, none of the parties had any firm evidence of their effectiveness in doing so. As mentioned above, the primary price promotion KPI (for both parties) was short-term sales uplift, a metric that provides no information about the size of or change in the customer base of a brand or a store. This highlights another disparity between the beliefs that underpin most price-promotion goals and decisions and the lack of empirical validation of whether that objective has been achieved, or even if achievable at all.

Previous academic studies have presented overwhelming evidence across multiple product categories and countries that the majority of buyers who bought a brand on price promotion had purchased the brand previously (Blattberg & Neslin, 1990; Ehrenberg et al., 1994). This generalizable finding suggests that price promotions rarely win new brand customers. Given the growing evidence that increasing penetration is the route to growth (Sharp, 2010), this information raises further questions about the usefulness of price promotions when compared to other marketing levers.

As for price promotions attracting new store customers, while no direct work testing this assumption exists, a significant amount of evidence suggests that price promotions bring insignificant increases in store traffic, not big enough to justify the reduced revenue due to selling goods at discount prices (Srinivasan et al., 2004). This indirect suggestion that price promotions fail to attract significant numbers of new store customers also fits with other evidence (Tiltman, 2012) that, contrary to the retailers' belief that price promotions drive store choice, shoppers' first main reason for choosing a store is convenience (e.g., store location close to their home). The second reason was the total basket price rather than the price of any specific item, followed by the variety of items available. So a belief that price promotions bring new consumers into the store is not supported by the academic evidence.

6.5. The role of price promotions in maintaining loyalty

Both manufacturers and retailers also viewed price promotions as vehicles of inducing or rewarding customer loyalty to a brand or store:

- "In my understanding, by giving the product on deal, I reward my loyal customers as they can buy it at a lower price."

[(Manufacturer, medium-tier role)]

Retailer experts particularly described the loyalty discounts or member only rewards as the best promotion types for them, because they were seen as helping to achieve the key objective of building customer loyalty to their store:

- "From retailers' perspective, this [loyalty reward] is the best one as the customers become loyal to the store and not to the manufacturers' brands."

[(Retailer, top-tier role)]

Nevertheless, just as with attracting new customers, none of the interviewed company experts or their documents provided any evidence of actually tracking price promotions' effectiveness in increasing customer loyalty. The sales volume data (primarily used for promotion evaluations) contain no information about store patronage, repeat visits, or repeat purchases of a brand. Panel data that could indicate customer loyalty or switching were rarely used to judge price promotions' success. The reasons for this omission are discussed in the next section.

The available academic evidence on the topic of price promotion effectiveness contradicts the managers' beliefs. Prior studies indicate that price promotions actually undermine customer loyalty by inducing brand switching through various mechanisms (e.g., Blattberg & Neslin, 1990; Gedenk & Neslin, 1999; Kopalle et al., 1999), including increased consumer price sensitivity (Kopalle et al., 1999; Mela, Jedidi, et al., 1998), decreased brand equity (Jedidi et al., 1999), and decreased perceived reference price (Chandrashekaran & Grewal, 2006; Mazumdar, Raj, & Sinha, 2005). Concerning store loyalty, as mentioned above, price promotions have little effect on store traffic or store switching, as only a few large manufacturer brands have enough inducing power to bring extra traffic, which is not enough to compensate for margin losses (Srinivasan et al., 2004). This is consistent with other findings that loyalty-reward promotions hardly alter loyalty (Sharp & Sharp, 1997). All in all, evidence from research suggests that price promotions decrease customer loyalty to brands and are ineffective in inducing loyalty to stores (Gedenk et al., 2010). Moreover, they might indirectly encourage store switching through increased multi-store patronage (Gijsbrechts, Campo, & Nisol, 2008).

To summarize, this paper has outlined the five most common objectives that managers at manufacturers and retailers pursue when running price promotions. The research has also discovered that in four of the five cases (immediate sales uplift being the exception), managers' own evaluating and reporting practices did not measure whether the objectives had been or could be achieved. The next section explores why this glaring mismatch between desired objectives and evaluation practices occurs.

6.6. Reasons for the mismatch between the objectives and evaluations

A mismatch between objectives and the evaluation of success has the potential to result in poor decision-making, because future planning will lack objective feedback on the previous decisions—that is, on what worked and what did not. To understand this big-picture problem, the research employed the elite expert technique. The researchers solicited the help of three international industry experts, all extensively published authors and frequent keynote speakers who have a bird's-eye view of the industry, to critique the results aggregated from the main interviews. The elite experts identified four main industry challenges that could explain the disparity between objectives and evaluation practices: (1) the lack of a baseline for comparison; (2) difficulty in teasing out the effect from the noise; (3) a lack of access to good data, especially among smaller players; and (4) the prohibitive cost of obtaining data beyond sales data, such as panel or survey data on cross-brand and cross-store consumer behaviors. The frequent implementation of price promotions combined with the pressure to measure on a routine and rapid basis were mentioned as further challenges. Some of these points echo the earlier explanations regarding the myopic short-term viewpoint of a business, ease of access to scanned data, and managers' short terms of employment (Lodish & Mela, 2007). Each point is discussed below.

Experts and industry statistics (Nielsen, 2015; SymphonyIRI Group, 2013) suggest that brands, categories, and stores are experiencing

unprecedentedly high levels of price promotions. This situation means that few clear periods when a target brand or category is *not* being promoted, and that could therefore be used as a benchmark or a baseline for comparison. This represents a significant barrier to measuring sales increases, a fact acknowledged by the interviewees:

- "It is hard to find clear sales data … the brand is on deal every single week."

[(Manufacturer, top-tier role)]

The second difficulty with evaluations concerns the complexity, intensity, and multiple types of price promotions. When multiple factors are implemented at the same time (such as promotion depth, framing, and length), analyzing each aspect of the process or to determine the effect of individual factors is almost impossible:

- "ROI is much talked about but rarely well mastered when it comes to price promotions. It's very hard to measure all the relevant components on a routine and rapid basis. … In general, retailers are poor at understanding overall promotional ROI when other factors are considered, including supply chain costs; inventory carrying costs; in-store implementation costs for the promotions and displays; promotion planning costs; reconciliation of the deal terms between manufacturers and retailers, etc. … Generally speaking, ROI is an underdeveloped skill area for retailers and brands alike. They tend to fall back on sales-lift analysis because it's still too hard to do otherwise."

[(Retail elite expert)]

The third difficulty preventing objective measurement of price promotions' effectiveness in achieving the desired objectives is related to organization size. Smaller companies cannot afford to buy good data. Therefore, these organizations generally use only their own sales data and gut feelings to evaluate price promotions effectiveness:

- "Our market is too small to carry out our own research but regional best practice studies provide information on the most successful promotions."

[(Manufacturer, entry-level role)]

Finally, even if the above-noted difficulties are addressed, sales data still won't deliver insight with regard to most of the reasons cited for running price promotions, such as improving manufacturer–retailer relationships, attracting new customers, or improving loyalty. These insights could come only from external data sources such as syndicated panel data or surveys, a resource rarely used due to its prohibitive cost. Earlier work interviewing managers on the use of scanner data also revealed the challenges involved in accessing the data, as well as numerous failures to use the data to their full potential to answer important managerial questions (Bucklin & Gupta, 1999).

These challenges inherent in accessing and analyzing the data cause managers to base decisions about price promotions on intuition, beliefs, and past experience, often with little or no empirical evidence to support those decisions:

- "There was no data, nothing … but based on my experience I believed in the brand so I could persuade the retailer to give it a chance … and it worked."

[(Manufacturer, medium-tier role)]

Indeed, prior studies observed similarly limited use of objective data in managerial decision-making (Azar, 2014; Rusetski, 2014; Thomas et al., 2010).

The reliance on intuitive reasoning in managerial decisions about price promotions could be responsible for the lack of profitable campaigns.

7. Contributions — practical and theoretical

Consumer price promotions are very frequent occurrences in retailing (Bogomolova et al., 2015), and businesses spend great amounts of time and money on them (Ailawadi et al., 2009; Bolton et al., 2010). Yet, despite their prevalence, these practices are ineffective and most of them provide a negative return to the companies responsible for them (Nielsen, 2015; Nielsen UK, 2015). A number of complex issues within the industry are to blame for the inefficiency of price promotions, the foremost is power imbalance between manufacturers and retailers, which leads to complicated under-the-table slotting allowances and general distrust between the parties (Ailawadi, 2001). However, due to the proprietary and highly confidential nature of these interactions, little detailed information has been available on how manufacturers and retailers make price-promotion decisions, what goals they hope to achieve, and how they evaluate the success. Understanding why retailers and manufacturers continue to use price promotions, despite their negative long-term consequences, is of paramount importance to manufacturers and retailers alike, as well as to researchers and policy makers (Ailawadi et al., 2009; Shankar et al., 2011).

Addressing the above situation, this work offers two fundamental contributions: (1) providing a detailed evidence-based account of *how* manufacturers and retailers make and evaluate price promotion decisions; and (2) explaining *why* they make the decisions that they do. Such work is an important foundation for the two major contributions that are discussed below.

The first is the identification of the five most prevalent goals that managers pursue when running price promotions, which is then linked to existing academic knowledge on promotion effectiveness. Drawn from 34 confidential industry interviews, this account of current practices advances the existing literature (Ailawadi et al., 2009; Shankar et al., 2011). Perkins and Rao (1990) pointed out that the ability to improve managerial decision-making requires an understanding of the decision process itself, and that "by studying practicing managers, we can understand better the elements that affect real-world decision making" (p. 1). The current work does this by documenting how managers make and evaluate price-promotion decisions, and how existing practice corresponds (or not) to best practice as outlined in the academic literature. Previous research has encouraged this descriptive approach for understanding marketing decisions in general (Wierenga, 2011), and price-promotion decisions specifically (Shankar et al., 2011).

The current data allows us to conceptualize five primary objectives that managers pursue when running price promotions (Fig. 2). As management theory suggests, managers should form objectives based on evidence from academia and their own practice. Following Wierenga (2002), who maintained that the marketing agenda should distinguish between good knowledge (i.e., knowledge that improves the quality of decision-making) and not so good or outright bad knowledge, these objectives are critiqued for consistency with the evidence.

The first objective is achieving a short-term bump in sales volume. As documented by academia, manufacturers, and retailers, practitioners are able to consistently achieve this objective. However, its long-term contribution toward achieving the other four objectives is questionable, according to academic evidence (Lodish & Mela, 2007). Hence, even though practitioners can pursue and reliably achieve a sales bump, what is not clear is whether this helps the company in the longer

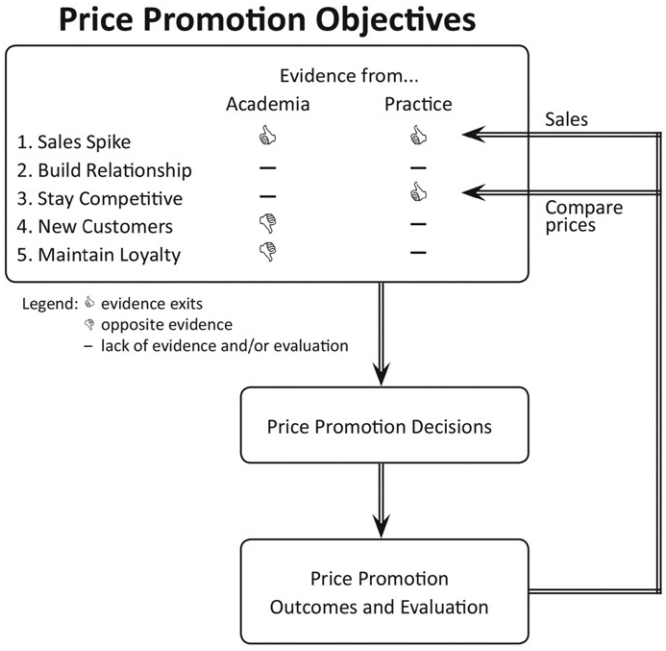


Fig. 2. Conceptual development.

term. Indeed, some authors refer to price promotions as addictions (Ambler, 1999) or short-term fixes (Kahn & McAlister, 1997). Some companies have tried to escape this vicious circle, albeit with mixed results; examples include Clorox (Lodish & Mela, 2007) and Procter & Gamble (Ailawadi, Lehmann, & Neslin, 2001), as well as the retailer J. C. Penney (Mourdoukoutas, 2013). The growing success of everyday low price (EDLP) retailers, such as Aldi and Lidl (Roy Morgan Research, 2014; Tonkin, 2015), is further testimony to the trend of moving away from perpetual price promotions.

The second objective for running price promotions is to build stronger relationships between manufacturers and retailers. However, the industry itself looks at these negotiations with mistrust, and whether anyone actually achieves better relationships is unclear, as systematic measurement of the quality of these relationships is not the norm. The academic literature on supply-chain relationships also does not provide strong evidence that price promotions strengthen trust between suppliers and retailers; promotions are instead often a mechanism for exercising power (Dapiran & Hogarth-Scott, 2003; Hingley, 2005; Kasulis, Morgan, Griffith, & Kenderdine, 1999). This suggests that the parties need other foundations for a good relationship beyond monetary exchange (Cadden, Humphreys, & McHugh, 2010).

The third objective involves staying competitive. However, the data and prior literature suggest that copycat practices dominate, thus rendering real innovation difficult (Pauwels, Silva-Risso, Srinivasan, & Hanssens, 2004). In contrast, the rise of discount retailers indicates that the innovation of offering EDLP instead of price promotions is perhaps delivering greater competitive advantage. Yet the success of these EDLP hard discounters is due to a wider range of factors other than simply pricing, including their whole store format and limited product range. The plethora of promotion types and framing techniques used by contemporary retailers (Bogomolova et al., 2015) also calls into question the validity of such activities. Various consumer associations, such as Which? in the United Kingdom (http://which.co.uk), and some academic studies (e.g., Anderson & Simester, 2003; Mitchell & Papavassiliou, 1999; Romani, 2006) have questioned whether consumers are better off as a result of promotional overload, or are becoming confused and making suboptimal decisions (such as buying more than they need or getting a poorer deal than they thought).

The last two objectives cited by the interviewees for running price promotions relate to winning new customers, as well as developing and maintaining customer loyalty. Manufacturers and retailers refer to pursuing these goals for their brands or stores, but neither party measures their achievement, primarily due to a lack of access to suitable data. Academic studies, on the other hand, have suggested that this goal is simply unrealistic, as price promotions rarely bring new customers (Ehrenberg et al., 1994), and do not induce long-term loyalty (Mela, Gupta, & Jedidi, 1998). If managers did look at the right data, perhaps they would come to the same conclusion.

To summarize, this research advances the existing knowledge on price promotions decision-making. It uncovers five common goals for running price-promotions, compares them to the evaluations conducted within the companies in search of evidence as to the achievement of these goals, and complements in-house information with academic knowledge to draw conclusions about the viability of achieving such goals. Specifically, the only readily achievable or verifiable objective of price promotions is a short-term sales spike — a strategy that carries the risk of poor long-term outcomes. The manufacturers and retailers did not evaluate any of the other objectives that they claim to pursue and, based on academic knowledge, these objectives are not achievable using promotions as the vehicle.

The second overarching contribution of this work is exploring *why* retailers and, particularly, manufacturers continue to engage in business practices that are not in their long run best interests. This research suggests three potentially cumulative explanations:

1. Managers do not have access to evidence that price promotions are not sustainable. The lack of data, skills, and reliable knowledge means that managers operate on short-term sales figures, which cloud the long-term picture. This prevents them from formulating more sustainable marketing strategies. Similar issues are echoed in other areas of marketing. For example, the process of decision-making in advertising budgeting is not as rational as economists and management scientists would prefer and has little evidence that the decisions can optimize profits (West et al., 2014). Similarly, few advertisers systematically document or access empirical evidence regarding which creative devices influence sales more often and under which conditions, thus limiting the opportunity to learn (Armstrong, 2010; Ewing & West, 2000; Hartnett, Kennedy, Sharp, & Greenacre, forthcoming).
2. The main driver of price-promotion decisions for manufacturers is pressure from retailers who, due to power imbalance, impose their terms in which price promotions feature quite heavily. This suggests that supply-chain relationships are extremely important to them. Yet the lack of systematic assessment of these relationships means the point at which the relationships get out of balance and start interfering with good decision-making is easily missed. The current research supports prior literature on supply-chain relationships, which has alluded to how an imbalance of power could lead to poor decisions by channel members (Dapiran & Hogarth-Scott, 2003; Hingley, 2005; Meehan & Wright, 2013). The contribution of this study is in documenting how price promotions have become the common mechanisms through which retailers and manufacturers navigate their relationships, and negotiate and demonstrate power.
3. Manufacturers' and retailers' declared goals for running price promotions (e.g., attracting new customers, maintaining loyalty) appear beneficial. This results in an insufficient critical appraisal, which is evident by the glaring lack of measurement. As a result, perpetual price promotions prevail. The dominance of copycat strategies further fuels unhealthy practices across the entire sector.

The second overarching contribution of this work is uncovering the reasons why managers make the decisions that they do. This extends the stream of academic research on determinants of decision-making (e.g., Ferrell & Gresham, 1985; West et al., 2014), including the role of relationships and power imbalance among supply-chain channel members (Dapiran & Hogarth-Scott, 2003; Hingley, 2005). Specifically, the work extends the recent theory of passivity, which previous researchers

observed in regular price settings (Watson et al., 2015), to price-promotion decisions. The default rule that the original authors observed in reluctance to change base prices translates in *price-promotion settings* into if in doubt — discount. Price discounting appears to be the default marketing tool for addressing a range of situations — from responding to competitor activity, to launching a new brand, to maintaining relationships with retailer partners and customers.

The researchers expect that other theoretical contributions will follow, given that theory and explanation follow documentation of regularities (Ehrenberg, 1995). The researchers strongly encourage further replications and extensions to ensure that the proposed theories are generalizable and truly evidenced-based.

8. Managerial and research implications

The findings suggest a pressing need to improve business intelligence in manufacturing and retail organizations to increase evidence-based price promotion decision-making. The results reveal a large gap between what managers hope to achieve and how they evaluate their success; this gap perpetuates the practice of poorly informed price promotions planning and decision-making.

The results suggest that if practitioners are committed to pursuing their stated goals (e.g., attracting new customers or building stronger supplier relationships), perhaps they should be systematically testing other mechanisms (e.g. advertising and innovation), and comparing them with price promotions to reach those goals. Doing so would probably lead decision makers to make different choices for profitable sales.

Opportunities may also exist to embed existing knowledge about what price promotions actually do in company rulebooks, and possibly in decision tools or marketing management support systems that capture this knowledge in computer programs. In this way, knowledge is available to marketing decision makers, which facilitates better decisions (Wierenga, van Bruggen, & Althuizen, 2008). Given the current gap between knowledge and practice, revisiting existing targets and incentives (e.g., sales bonuses) that continue to perpetuate short-term sales goals to the detriment of longer-term profitability is necessary.

9. Academic implications and the future research agenda

The findings carry insights for academic researchers, indicating that academic learnings, however useful, are not reaching prospective end users (marketing decision makers). This gap is evident in the goals that practitioners reported pursuing through price promotions, even though multiple academic studies have already shown these goals (e.g., attracting new customers or increasing loyalty) to be unrealistic. While Reibstein, Day, and Wind (2009) observed an alarming and growing gap between academic marketers and marketing executives, calling for the marketing academic community to work on relevant business problems, here pertinent knowledge exists within academia, but is not used in industry. While the researchers acknowledge that practitioners are unlikely to read even the most prominent marketing academic journals, perhaps the journals should consider producing managerial snapshots that could be more easily disseminated. Other possible strategies to explore are extending the forum for academic discoveries beyond academic circles and looking at ways to embed knowledge in tools that facilitate evidenced-based decision-making, such as the marketing management support systems (MMSS) discussed above. Clearly, this is a challenging research agenda for demonstrating the effectiveness and usefulness of such tools.

Testing some of the theoretical frameworks and conceptualizations from the broad decision-making domain (e.g., cognitive-appraisal theory, organizational culture (White et al., 2003); risk propensity; organizational knowledge, and experience) directly in price-promotion decision-making may yield useful insights that further help to understand and improve future decision-making.

More specifically this research identifies a need for:

- Better understanding of the role of price promotions in building stronger relationships between manufacturers and retailers, relative to other activities;
- Further documentation of whom price promotions impact (e.g., existing versus new store customers); and under what conditions (e.g. established versus new products);
- Identifying the other factors that managers take (or should take) into account when planning price promotions—for example, consumer expectations and perceptions of pricing decisions such as depth of discount and duration (Weathers, Swain, & Makienko, 2015);
- Further examination of the effects of loyalty or member-only promotions on sales, customer perceptions, and customer behavior in comparison with other types of activities;
- Documenting what happens when retailers and/or manufacturers quit the price promotion game (under varying conditions), thus furthering research of the type carried out by Ailawadi et al. (2001);
- Understanding how best to schedule price promotions along with other activities in order to leverage synergies (Naik, Raman, & Winer, 2005); and
- Documenting the best combinations of spending on price promotions and /or other in-store activities versus out-of-store advertising (Jedidi et al., 1999; Low & Mohr, 2000; Naik et al., 2005).

Although five types of stores (hypermarkets, supermarkets, discounters, pharmacies, and health, beauty and well-being stores) were represented in this study, other retailers, such as department stores, apparel/clothing retailers and mass merchandisers, should be examined to achieve a more complete understanding of retail price-promotion decision-making. The likes of different supply chains and perishability of the products may see some differences emerge. Research into the differences between the price-promotion decision-making of traditional (groceries, pharmacies) and nontraditional (online stores) retailers would be also beneficial, along with studying the differences between mature and emerging markets.

A survey could be useful to quantify the present study's findings by measuring the prevalence of certain practices and beliefs and providing generalizable findings about price-promotion decision-making. Linking the different behaviors to their impact on brands and stores (e.g., in terms of growth, profit, and market share) is a critical future step to advance knowledge. Further research could also investigate the beliefs surrounding decisions around price-promotion discount depth, frequency, and displays or other supporting features, as well as the use of framing techniques. These decisions will have major implications for the financial performance of manufacturers and retailers alike.

Marketing research would benefit from reporting and analyzing price promotion data separately from advertising expenditure, as opposed to integrating them (A&P) as is often done (e.g. Conchar, Crask, & Zinkhan, 2005). Because these activities achieve quite different objectives, combining them within studies disguises the distinct ways in which they impact brand sales and profitability. Both price promotion and advertising need to be evaluated against their ability to sell (e.g. Hartnett, Kennedy, Sharp, & Greenacre, 2016) and to profitably grow brands or retailers (e.g. Riebe, Wright, Stern, & Sharp, 2014; Sharp, 2010; Sharp et al., 2012). As research evidence builds, much scope surrounds further conceptualize and develop evidenced-based theory around what price promotions actually do, linking this to the growing interest in how brands and categories profitably grow in the medium and longer term.

The researchers encourage academics interested in this area to explore approaches proposed in the managerial decision-making literature (e.g. Wierenga, 2011), moving beyond interviews, surveys, and case studies towards other forms of observation (e.g., text mining) and experiments using behavioral laboratories. Challenges will exist

with these methods, specifically in procuring relevant documents for text mining procedures, given their confidential nature. Testing decisions across realistic scenarios may be a useful strategy to avoid some of these sensitivities.

Acknowledgement

The authors would like to thank the retailers and manufacturers involved in this research for their generosity in sharing their time and expertise along with the reviewers for their constructive inputs.

References

Ailawadi, K. L. (2001). The retail power-performance conundrum: What have we learned? *Journal of Retailing, 77*(3), 299–318.
Ailawadi, K. L., Lehmann, D. R., & Neslin, S. A. (2001). Market response to a major policy change in the marketing mix: Learning from procter & gamble's value pricing strategy. *Journal of Marketing, 65*(January), 44–61.
Ailawadi, K. L., Beauchamp, J. P., Donthu, N., Gauri, D. K., & Shankar, V. (2009). Communication and promotion decisions in retailing: A review and directions for future research. *Journal of Retailing, 85*(1), 42–55.
Ambler, T. (1999). Kicking price promotion habit is like getting off heroin - hard. *Marketing, 27*.
Anderson, E., & Simester, D. (2003). Mind your pricing cues. *Harvard Business Review*, 96–103.
Armstrong, J. S. (2010). *Persuasive advertising: Evidence-based principles*. Basingstoke: Palgrave Macmillan.
Armstrong, J. S., Green, K. C., & Graefe, A. (2015). Golden rule of forecasting: Be conservative. *Journal of Business Research, 68*(8), 1717–1731.
Ataman, M. B., Van Heerde, H. J., & Mela, C. F. (2010). The long-term effect of marketing strategy on brand sales. *Journal of Marketing Research, 47*(5), 866–882.
Azar, O. H. (2014). The default heuristic in strategic decision making: When is it optimal to choose the default without investing in information search? *Journal of Business Research, 67*(8), 1744–1748.
Bijmolt, T. H. A., van Heerde, H. J., & Pieters, R. G. M. (2005). New empirical generalizations on the determinants of price elasticity. *Journal of Marketing Research, XLII*(May), 141–156.
Blattberg, R. C., & Neslin, S. A. (1990). *Sales promotion - concepts, methods and strategies*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
Blattberg, R. C., Briesch, R., & Fox, E. J. (1995). How promotions work. *Marketing Science, 14*(3, Part 2), G122–G132.
Bloor, M. (1997). Addressing social problems through qualitative research. In D. Silverman (Ed.), *Qualitative research: Theory, method and practice*. London: Sage.
Bogomolova, S., Dunn, S., Trinh, G., Taylor, J., & Volpe, R. J. (2015). Price promotion landscape in the us and uk: Depicting retail practice to inform future research agenda. *Journal of Retailing and Consumer Services, 25*, 1–11.
Bolton, R., Shankar, V., & Montoya, D. (2010). Recent trends and emerging practices in retailer pricing. In M. Krafft, & M. K. Mantrala (Eds.), *Retailing in the 21st century: Current and future trends* (pp. 245–359). Berlin: Springer-Verlag.
Bucklin, R. E., & Gupta, S. (1999). Commercial use of upc scanner data: Industry and academic perspectives. *Marketing Science, 18*(3), 247–273.
Cadden, T., Humphreys, P., & McHugh, M. (2010). The influence of organisational culture on strategic supply chain relationship success. *Journal of General Management, 36*(2), 37–64.
Chandrashekaran, R., & Grewal, D. (2006). Anchoring effects of advertised reference price and sale price: The moderating role of saving presentation format. *Journal of Business Research, 59*, 1063–1071.
Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis: Sage Publications Ltd.*
Conchar, M. P., Crask, M. R., & Zinkhan, G. M. (2005). Market valuation models of the effect of advertising and promotional spending: A review and meta-analysis. *Journal of the Academy of Marketing Science, 33*(4), 445–460.
Covin, J. G., Slevin, D. P., & Heeley, M. B. (2001). Strategic decision making in an intuitive vs. Technocratic mode: Structural and environmental considerations. *Journal of Business Research, 52*(1), 51–67.
Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks: Sage.
Dapiran, G. P., & Hogarth-Scott, S. (2003). Are co-operation and trust being confused with power? An analysis of food retailing in australia and the uk. *International Journal of Retail and Distribution Management, 31*(5), 256–267.
Denzin, N. K. (1970). *The research act in sociology*. Chicago: Aldine.
Denzin, N. K., & Lincoln, Y. S. (2005). *The sage handbook of qualitative research* (3rd ed.). Thousand Oaks Sage Publications.
Duke, R. (1998). A model of buyer-supplier interaction in uk grocery retailing. *Journal of Retailing and Consumer Services, 5*(2), 93–103.
Ehrenberg, A. (1995). Empirical generalisations, theory, and method. *Marketing Science, 14*(3), G20–G28.
Ehrenberg, A., Hammond, K., & Goodhardt, G. J. (1994). The after-effects of price-related consumer promotions. *Journal of Advertising Research, 34*, 11–21.
Emerson, R. M., & Pollner, M. (1988). On the uses of members' responses to researchers' accounts. *Human Organization, 47*(3), 189–198.
Ewing, M. T., & West, D. (2000). Advertising knowledge management: Strategies and implications. *International Journal of Advertising, 19*(2), 225–243.
Ferrell, O. C., & Gresham, L. G. (1985). A contingency framework for understanding ethical decision making in marketing. *Journal of Marketing, 49*(Summer), 87–96.
Gedenk, K., & Neslin, S. A. (1999). The role of retail promotion in determining future brand loyalty: Its effect on purchase event feedback. *Journal of Retailing, 75*(4), 433–459.
Gedenk, K., Neslin, S., & Ailawadi, K. (2010). Sales promotion. In M. Krafft, & M. K. Mantrala (Eds.), *Retailing in the 21st century: Current and future trends* (pp. 393–407). Berlin: Springer-Verlag.
Gigerenzer, G. (2004). Fast and frugal heuristics: The tools of bounded rationality. In D. Koehler, & N. Harvey (Eds.), *Blackwell handbook of judgment and decision making* (pp. 62–88). Oxford, UK: Blackwell.
Gijsbrechts, E., Campo, K., & Nisol, P. (2008). Beyond promotion-based store switching: Antecedents and patterns of systematic multiple-store shopping. *International Journal of Research in Marketing, 25*(1), 5–21.
Green, K. C., & Armstrong, J. S. (2015). Simple versus complex forecasting: The evidence. *Journal of Business Research, 68*, 1678–1685.
Guyt, J. Y., & Gijsbrechts, E. (2014). Take turns or march in sync? The impact of the national brand promotion calendar on manufacturer and retailer performance. *Journal of Marketing Research, 51*(6), 753–772.
Hartnett, N., Kennedy, R., Sharp, B., & Greenacre, L. (2016a). Creative that sells: How advertising execution affects sales. *Journal of Advertising, 45*(1), 102–112.
Hartnett, N., Kennedy, R., Sharp, B., & Greenacre, L. (2016b). Marketers' intuitions about the sales effectiveness of advertisement. *Journal of Marketing Behaviour* (forthcoming).
Harvey, W. S. (2010). Methodological approaches for interviewing elites. *Geography Compass, 4*(3), 193–205.
Hingley, M. K. (2005). Power to all our friends? Living with imbalance in supplier–retailer relationships. *Industrial Marketing Management, 34*(8), 848–858.
Howard, J. A., & Morgenroth, W. M. (1968). Information processing model of executive decision. *Management Science, 14*(7), 416–428.
Jedidi, K., Mela, C. F., & Gupta, S. (1999). Managing advertising and promotion for long-run profitability. *Marketing Science, 18*(1), 1–22.
Kahn, B. E., & McAlister, L. (1997). *Grocery revolution: The new focus on the consumer*. Reading, MA: Addison Wesley.
Kahneman, D. (2003). Maps of bounded rationality: Psychology for behavioral economics. *The American Economic Review, 93*(5), 1449–1475.
Kahneman, D. (2011). *Thinking, fast and slow: Farrar Straus & Giroux*.
Kasulis, J. J., Morgan, F. W., Griffith, D. E., & Kenderdine, J. M. (1999). Managing trade promotions in the context of market power. *Journal of the Academy of Marketing Science, 27*(3), 320–332.
Kopalle, P. K., Mela, C. F., & Marsh, L. (1999). The dynamic effect of discounting on sales: Empirical analysis and normative pricing implications. *Marketing Science, 18*(3), 317–332.
Kvale, S. (1996). *Interviews: An introduction to qualitative research interviewing*. Thousand Oaks, London: SAGE Publications.
Lazarus, R. S. (1991). *Emotion and adaptation*. New York: Oxford University Press.
Lincoln, Y., & Guba, E. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.
Lodish, L. M., & Mela, C. F. (2007). If brands are built over years, why are they managed over quarters? *Harvard Business Review, 85*(7/8), 104–112.
Low, G. S., & Mohr, J. J. (2000). Advertising vs sales promotion: A brand management perspective. *Journal of Product & Brand Management, 9*(6), 389–414.
Marshall, C., & Rossman, G. B. (2011). *Designing qualitative research* (5th ed.). California: Sage Publications, Incorporated.
Mazumdar, T., Raj, S. P., & Sinha, I. (2005). Reference price research: Review and propositions. *Journal of Marketing, 69*(October), 84–102.
Meehan, J., & Wright, G. H. (2013). Power priorities in buyer–seller relationships: A comparative analysis. *Industrial Marketing Management, 42*(8), 1245–1254.
Mela, C. F., Gupta, S., & Jedidi, K. (1998a). Assessing long-term promotional influences on market structure. *International Journal of Research in Marketing, 15*(Number 2, May), 89–107.
Mela, C. F., Jedidi, K., & Bowman, D. (1998b). The long-term impact of promotions on consumer stockpiling behavior. *Journal of Marketing Research, 35*(May), 250–262.
Mitchell, V. W., & Papavassiliou, V. (1999). Marketing causes and implications of consumer confusion. *Journal of Product & Brand Management, 8*(4), 319–342.
Morse, J. M. (1991). Approaches to qualitative-quantitative methodological triangulation. *Nursing Research, 40*(2), 120–123.
Mourdoukoutas, P. (2013, September 26). *A strategic mistake that haunts jc penny*. Forbes.
Naik, P., Raman, K., & Winer, R. S. (2005). Planning marketing-mix strategies in the presence of interaction effects. *Marketing Science, 24*(1), 25–34.
Neslin, S. (2002). *Sales promotions*. Cambridge: Marketing Science Institute.
Neuman, W. L. (2006). *Social research methods: Qualitative and quantitative approaches* (6th ed.). Boston: Allyn & Bacon.
Nielsen (2015). *The path to efficient trade promotions*. Online: The Nielsen Company, 1–20.
Nielsen UK (2015). *Most grocery trade promotions lose money for suppliers*. Online: The Nielsen Company.
Nijs, V. R., Dekimpe, M. G., Steenkamp, J. -B. E. M., & Hanssens, D. M. (2001). The category-demand effects of price promotions. *Marketing Science, 20*(1), 1–22.
Patton, M. Q. (2002). *Qualitative research & evaluations methods* (3rd ed.). Sage.
Pauwels, K., Silva-Risso, J., Srinivasan, S., & Hanssens, D. M. (2004). New products, sales promotions, and firm value: The case of the automobile industry. *Journal of Marketing, 68*(October), 142–156.
Perdue, B. C., Day, R. L., & Michaels, R. E. (1986). Negotiation styles of industrial buyers. *Industrial Marketing Management, 15*, 171–176.

Perkins, S., & Rao, R. C. (1990). The role of experience in information use and decision making by marketing managers. *Journal of Marketing Research*, *27*(1), 1–10.
Reibstein, D. J., Day, G., & Wind, J. (2009). Guest editorial: Is marketing academia losing its way? *Journal of Marketing*, *73*(4), 1–3.
Riebe, E., Wright, M., Stern, P., & Sharp, B. (2014). How to grow a brand: Retain or acquire customers? *Journal of Business Research*, *67*(5), 990–997.
Robson, S. (1993). Analysis and interpretation of qualitative findings. Report of the mrs qualitative interest group. *Journal of the Market Research Society*, *35*(1, January), 23–35.
Robson, S., & Foster, A. (1989). *Qualitative research in action: Edward Arnold.*
Romani, S. (2006). Price misleading advertising: Effects on trustworthiness toward the source of information and willingness to buy. *Journal of Product & Brand Management*, *15*(2), 130–138.
Roy Morgan Research (2014). *Market share narrows between coles and woolworths, while aldi makes important gains.* (Online).
Rusetski, A. (2014). Pricing by intuition: Managerial choices with limited information. *Journal of Business Research*, *67*(8), 1733–1743.
Shankar, V., Inman, J. J., Mantrala, M., Kelley, E., & Rizley, R. (2011). Innovations in shopper marketing: Current insights and future research issues. *Journal of Retailing*, *87*, S29–S42.
Sharp, B. (2010). *How brands grow.* Melbourne: Oxford University Press.
Sharp, B., & Sharp, A. (1997). Loyalty programs and their impact on repeat-purchase loyalty patterns. *International Journal of Research in Marketing*, *14*(5), 473–486.
Sharp, B., Wright, M., Dawes, J., Driesener, C., Meyer-Waarden, L., Stocchi, L., & Stern, P. (2012). It's a dirichlet world: Modeling individuals' loyalties reveals how brands compete, grow, and decline. *Journal of Advertising Research*, *52*(2), 203–213.
Smith, J. B., & Barclay, D. W. (1997). The effects of organizational differences and trust on the effectiveness of selling partner relationships. *Journal of Marketing*, *61*(January), 3–21.
Srinivasan, S., Pauwels, K., Hanssens, D. M., & Dekimpe, M. G. (2004). Do promotions benefit manufacturers, retailers, or both? *Management Science*, *50*(5), 617–629.
Steenkamp, J. -B. E. M., Nijs, V. R., Hanssens, D. M., & Dekimpe, M. G. (2005). Competitive reactions to advertising and promotion attacks. *Marketing Science*, *24*(1), 35–54.
SymphonyIRI Group (2013). *Merchandising trends: Supporting the value proposition.* Chicago: SymphonyIRI Group Inc.
Thomas, R. W., Esper, T. L., & Stank, T. P. (2010). Testing the negative effects of time pressure in retail supply chain relationships. *Journal of Retailing*, *86*(4), 386–400.
Tiltman, D. (2012). *Trends report on shopper marketing.* Online: Warc.
Tonkin, B. (2015). *Three's a crowd: The rapid expansion of aldi is challenging coles and woolworths' duopoly IBIS World Industry Report G4111 - Supermarkets and Grocery Stores in Australia.* Online: IBIS World, 1–35.
Van Bruggen, G. H., & Wierenga, B. (2010). Marketing decision making and decision support: Challenges and perspectives for successful marketing management support systems. *Foundations and Trends in Marketing*, *4*(4), 209–332.
Vermillion, L. J., Lassar, W. M., & Winsor, R. D. (2002). The hunt–vitell general theory of marketing ethics: Can it enhance our understanding of principal–agent relationships in channels of distribution? *Journal of Business Ethics*, *41*(3), 267–285.
Watson, I., Wood, S., & Fernie, J. (2015). 'Passivity': A model of grocery retail price decision-making practice. *European Journal of Marketing*, *49*(7/8), 1040–1066.
Weathers, D., Swain, S. D., & Makienko, I. (2015). When and how should retailers rationalize the size and duration of price discounts? *Journal of Business Research*, *68*, 2610–2618.
West, D., & Crouch, G. I. (2007). Advertising budgeting practices in australia and new zealand. *Australian Marketing Journal*, *15*(3), 21–34.
West, D., & Prendergast, G. P. (2009). Advertising and promotions budgeting and the role of risk. *European Journal of Marketing*, *43*(11/12), 1457–1476.
West, D., Ford, J. B., & Farris, P. W. (2014). How corporate cultures drive advertising budgets: Best practices combine heuristics and algorithmic tools. *Journal of Advertising Research*, *54*(2), 149–162.
West, D., Prendergast, G., & Shi, Y. -Z. (2015). *Advertising budgeting methods and processes in china Assessing the different roles of marketing theory and practice in the jaws of economic uncertainty.* Springer International Publising, 288–294.
White, J. C., Varadarajan, P. R., & Dacin, P. A. (2003). Market situation interpretation and response: The role of cognitive style, organizational culture, and information use. *Journal of Marketing*, *67*(3), 63–79.
Wierenga, B. (2002). On academic marketing knowledge and marketing knowledge that marketing managers use for decision-making. *Marketing Theory*, *2,4*(December), 355–362.
Wierenga, B. (2011). Managerial decision making in marketing: The next research frontier. *International Journal of Research in Marketing*, *28*(2), 89–101.
Wierenga, B., van Bruggen, G. H., & Althuizen, N. A. P. (2008). Advances in marketing management support systems. In B. Wierenga (Ed.), *Handbook of marketing decision models* (pp. 561–592). New York: Springer.
Zippel, C., Wilkinson, J., & Vogler, T. (2013). The influence of private labels on retailer cooperation. *Australasian Marketing Journal*, *21*(4), 271–277.

Journal of Business Research 76 (2017) 201–208

Contents lists available at ScienceDirect

Journal of Business Research

Purchase decision regret: Negative consequences of the Steadily Increasing Discount strategy

Colin B. Gabler [a,*], V. Myles Landers [b], Kristy E. Reynolds [c]

[a] College of Business, Copeland Hall 530, Ohio University, Athens, OH 45701, United States
[b] Department of Marketing, Saunders College of Business, Rochester Institute of Technology, 105 Lomb Memorial Dr., Rochester, NY 14623, United States
[c] Department of Management and Marketing, Culverhouse College of Commerce, The University of Alabama, Box 870225, Tuscaloosa, AL, United States

ARTICLE INFO

Article history:
Received 15 July 2015
Received in revised form 4 March 2016
Accepted 23 April 2016
Available online 9 January 2017

Keywords:
Regret
Scarcity
Discount
Omission bias
Expected utility
Retail

ABSTRACT

The Steadily Increasing Discount pricing strategy pits product scarcity against a future discount and forces consumers to make a choice between cost savings and the potential risk of missing the purchase opportunity. Dual non-student samples provide insight into the regret associated with this decision. The first study finds that product scarcity increases both action regret (purchase) and inaction regret (non-purchase) while the level of discount only influences inaction regret. In study two, the individual characteristics of materialism and price consciousness both impact the decision to buy, only materialism influences purchase decision regret. Theoretically, the results reverse the omission bias, demonstrating that regret from inaction is more salient than regret from action in this purchase situation. The studies underscore the high-risk, high-reward nature of multi-period pricing for managers. While firms control product availability and discount levels, they cannot control their customers' personality traits. Therefore, they should make every effort to understand their customers before embarking on such a strategy.

1. Introduction

Retail strategy and consumer shopping behavior have fundamentally changed. Shoppers are more deliberate than ever as retailers try to entice consumers to spend money on discretionary items (Banjo & Germano, 2014). In this post-recession shopping landscape, discount pricing is an even more prominent sales promotion tool (Rollins, Nickell, & Ennis, 2014). For example, managers utilize seasonal discounting to unload excess inventory and make room for newer merchandise. An emergent pricing strategy, the Steadily Increasing Discount (SID) manipulates scarcity (availability of the product) and the upcoming discount schedule to maximize profit and move merchandise (Gabler & Reynolds, 2013).

Consumers generally choose to overpay for a product they want rather than miss the opportunity altogether. However, while the SID may increase purchase intent, it may also create negative consequences, and thus, warrants examination. Indeed, persuading consumers to purchase products is an important marketing goal (Reynolds, Jones, Gillison, & Musgrove, 2012) but considering the need to establish loyalty and customer lifetime value, the risk of alienating, upsetting, confusing, or angering customers (Garaus, Wagner, & Kummer, 2015) is a possibility that managers must consider when developing their pricing strategy.

The current research investigates the regret associated with such a discounting strategy and advances three contributions. First, the paper leverages expected utility theory (EUT) and the omission bias to explain consumer decision-making in a SID context. Next, study 1 examines the two key components of the SID, finding that while scarcity influences the regret associated with action and inaction, discount level only influences the latter. Study 2 takes place in a traditional retail setting, uncovering that two personal characteristics play a role in how consumers react to the SID strategy. Specifically, materialism and price consciousness both influence purchase likelihood; however, only materialism increases purchase decision regret.

These contributions have both practical and theoretical implications. For scholars, it tests neoclassical utility maximization principles in a consumer behavior context, challenging the assumption of what utility means to different people. Further, because inaction regret appears more salient than action regret, the results contradict the omission bias. Instead, the findings advance the 'inaction effect' described by Zeelenberg et al. (2002). For managers, the results uncover the major advantage and disadvantage of enacting the SID pricing strategy. On the one hand, it drives purchase intent, which can generate revenue. On the other, it has the potential to create regret among shoppers, which leads to other negative outcomes. These pros and cons make it a high-risk, high-reward strategy for managers. To optimize the SID

* Corresponding author.
E-mail addresses: gabler@ohio.edu (C.B. Gabler), vlanders@saunders.rit.edu (V. Myles Landers), kreynold@cba.ua.edu (K.E. Reynolds).

http://dx.doi.org/10.1016/j.jbusres.2017.01.002
0148-2963/

strategy, not only must managers consider product availability and discount levels before implementation, they should understand the personality traits of their consumers.

2. Theoretical development

2.1. Pricing and discounting

Existing pricing literature covers a range of topics, from reference points and price sensitivity to the implementation of specific pricing tactics (cf. Han, Gupta, & Lehmann, 2001; Kopalle & Lindsey-Mullikin, 2003; Tsiros & Hardesty, 2010). Pricing practices have evolved with the marketplace as scholars tackle emergent issues, such as online price search and mobile shopping (cf. Bodor, Klein, & Arora, 2015; Wang, Malthouse, & Krishnamamurthi, 2015). Within this domain, scholars have also examined product scarcity and discounting schedules to predict consumer decision-making. Aydinli, Bertini, and Lambrecht (2014) argue that price promotions decrease consumer motivation to process a decision. The result is a quicker, more spontaneous response. For firms, the more effectively you can trigger a purchase, the better, simply because increased purchases equate to increased revenue (Reynolds et al., 2012).

However, consumers now have a plethora of information. For example, by merely looking at the price's final digit (e.g., $6.99 versus $6.97 versus $6.24), individuals can determine a product's likelihood to go [or be] on sale (Uhler, 2014). Further, many retailers provide detailed information about inventory levels, price changes, and their strategies. Grocery retailers use this technique in everything from day-old bread to packaged meat nearing its due date (cf. Theotokis, Pramatari, & Tsiros, 2012; Chung and Li, 2013), while clothing retailers, consignment shops, department stores, and drug stores often label clearance sections with current and future discounts.

Pricing, then, remains a dynamic managerial tool (Grewal, Roggeveen, Compeau, & Levy, 2012), which managers use to create in-store experiences that differentiate themselves from other retailers (e.g., Kiran, Majumdar, & Kishore, 2012). For their part, consumers are more price conscious and savvy than ever (Grewal et al., 2012), and they still garner enjoyment and excitement from the shopping experience (Arnold & Reynolds, 2003). This puts pressure on retailers to create pricing schedules, such as multi-period pricing, that simultaneously optimizes profitability (cf. Kaltcheva, Winsor, Patino, & Shapiro, 2013) and attracts shoppers.

2.2. The Steadily Increasing Discount strategy

Multi-period pricing is an effective way for managers to reduce inventory and clear products from their shelves (Chung and Li 2013) while generating a buzz among consumers. One specific multi-period pricing strategy, the Steadily Increasing Discount (SID) has emerged to capitalize on the dueling forces of product scarcity and discount schedules. Online retailers such as Groupon.com, Woot.com, and Steepandcheap.com already implement SID to elevate interest and increase purchase intent (Coulter & Roggeveen, 2012). However, it could be particularly effective in brick and mortar outlets to move seasonal inventory or stimulate competition among shoppers. To implement SID, a store offers some product in limited supply, and then lowers the price incrementally until it has sold every item (Gabler & Reynolds, 2013). See Fig. 1.

Consumers must make a decision: guarantee the product by spending more money right now or risk missing the product by waiting for the discount to occur. This method is common in second-hand shopping settings (e.g., garage sales, consignment shops) which are becoming more important retail contexts (Grewal et al., 2012), and it is now gaining footing in mainstream retail. For instance, Chung and Li (2013) find that incremental discounts on perishable items as they approach expiration increase customer satisfaction in grocery stores.

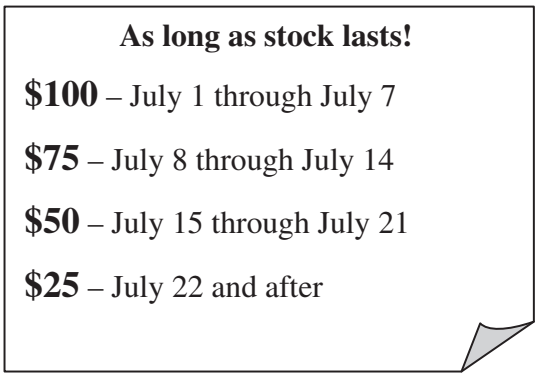


Fig. 1. Example of a price tag utilizing the Steadily Increasing Discount strategy.

Similarly, while not specifically advertised, Target uses SID to mark down products in increments of 15%, 30%, 50%, 75%, and 90% (Uhler, 2014) until the product sells out.

The SID strategy hinges not just on multi-period discounting but scarcity, or the number of products available. When a product is scarce, consumers find the product more valuable (Cialdini, 2008). Scarcity creates the illusion of value while limiting the available information and time to make the decision (Aggarwal, Jun, & Huh, 2011). Consumers see the effects of scarcity when luxury brands release limited edition products (Jang, Ko, Morris, & Chang, 2015), and even among big box store retailers like Target, which recently launched a limited Lilly Pulitzer collection (Schneier, 2015). Importantly for this research, limited quantity messages have a greater impact on consumer behavior than limited time messages (Aggarwal et al., 2011). Within an SID framework, the scarcer the product, the greater the purchase likelihood (Gabler & Reynolds, 2013). The SID strategy also depends how individual consumers maximize utility.

2.3. Expected utility theory in the SID context

Every purchase decision is a measure of how much one receives versus how much one gives up in a transaction. With regard to this evaluation process, managers can tease out different types of consumer responses, both rational and irrational (Hinterhuber, 2015). According to the expected-utility theory (EUT), individuals attempt to maximize the expected utility of their possessions in any uncertain decision (Von Neumann & Morgenstern, 1947). With unknown outcomes, individuals weigh the probability and utility of each possible outcome and make the optimal decision (Mongin, 1997).

Managers understand that consumers view utility in terms of either a price-quality or a price-sacrifice relationship, and firms use this to their advantage. Some consumers perceive utility as gaining the maximum value for the price incurred while others simply want to minimize the disutility associated from spending money (Monroe, 2003). With unlimited decision time and product availability, consumers tend to weigh the price-sacrifice relationship more heavily (Lichtenstein, Bloch, & Black, 1988). However, when firms restrict either time or availability, consumers lack the ability to process all of the available information. In this case, price acts more as an indicator of quality than monetary sacrifice, shifting the utility formation process toward the price-quality relationship (Suri & Monroe, 2003).

Because the SID strategy employs the restriction of scarcity with a discount, the outcomes are unknown and, thus, the decision is uncertain. Individuals have less time to process the information and have incentives to both buy now and buy later. According to EUT (Mongin, 1997; Von Neumann & Morgenstern, 1947), an individual will aim to maximize utility by gaining the most value for the minimum price. However, they also consider other resources, such as time and effort (Punj, 2012), which affect overall utility. While EUT has predicted

purchase intent in an SID context, Gabler and Reynolds (2013) acknowledge that negative consequences may surface when a pricing tactic causes disutility. One possible consequence is regret.

2.4. Customer regret and omission bias in the SID context

Regret is a negative emotion that occurs when people realize that their present situation would have been better had they chosen differently (Loomes & Sugden, 1982; Zeelenberg, van den Bos, van Kijk, & Pieters, 2002). Individuals experience higher or lower levels of regret depending on how much they know about the alternatives (Tsiros & Mittal, 2000), as well as personal traits (Loomes & Sugden, 1982). Regret, then, requires the existence of another option (Zeelenberg, Kijk, Manstead, & Pligt, 2000), and logically, people avoid it when at all possible (Bell, 1982).

This research investigates three related types of regret. The first is inaction regret, or "the negative feeling that arises when…the chosen alternative (non-purchase) appears to be a worse choice than the non-chosen alternative (purchase; Zeelenberg et al., 2000)" (Patrick, Lancellotti, & Demello 2009, p. 464–465). The second is action regret, or the negative emotion that results when making the purchase is a worse choice than a non-purchase. The third is a composite of the first two. Borrowing from Zeelenberg et al. (2000), purchase decision regret refers to the negative emotion that occurs "when a decision appears to be wrong in retrospect, and/or when the obtained decision outcome does not live up to expectations" (p. 521). Importantly, this construct encompasses the regret of both the purchase and the non-purchase decision.

The final theoretical concept of this research is the omission bias. Essentially, individuals judge outcomes differently depending on whether they result from action or inaction (e.g., Landman, 1987). Importantly, when a decision results in a poor or suboptimal outcome, individuals evaluate that decision more negatively if it stems from action rather than inaction (e.g., Spranca, Minsk, & Baron, 1991). This tendency to overweight the results of an action over the results of an inaction is the *omission bias* (Kordes-de Vaal, 1996), which relates directly to EUT. Specifically, while any suboptimal choice reduces utility (Mongin, 1997), suboptimal choices resulting from action should garner even less utility than those resulting from inaction. Combining the omission bias with EUT, to maximize utility, individuals will generally make purchase decisions that—if suboptimal—result in minimal purchase decision regret.

3. Hypothesis development

3.1. Scarcity and discount level

Scholars have given plenty of attention to regret in relation to consumer decision-making (e.g., Patrick et al., 2009; Tsiros, 2009; Zeelenberg et al., 2002), yet Tsiros and Mittal (2000) specifically call for the examination of its antecedents. Two antecedents may be scarcity and promotional discounts, which allow consumers to anticipate—and possibly avoid—regret (Coulter & Roggeveen, 2012; Simonson, 1992). Consider "Don't miss this once in a lifetime sale!" advertisements. Individuals do not like to miss opportunities (Ritov & Baron, 1995), and firms use this to their advantage, designing messages to trigger the action to buy and, as a result, avoid potential regret.

During post-decision evaluation, a forgone alternative acts as a reference to the choice made (Tsiros & Mittal, 2000). When individuals compare their choice to a better alternative, EUT suggests that they will regret their decision, and the level of regret depends on the amount of utility lost in making that decision. Because scarcity increases a product's perceived value (Cialdini, 2008), or utility, it may influence this relationship. If a consumer waits for a sale to buy a scarce item, but misses the opportunity, the resulting inaction regret should be higher than for someone who waited and missed the opportunity to buy a readily available item. Similarly, if a consumer buys a scarce item and returns to find one available at the sale price, the resulting action regret should be higher than for someone who missed a readily available item because scarcity made the decision more important, and thus, the negative consequence more salient. Formally, the first two hypotheses are as follows.

H1a. Scarcity positively influences inaction regret.

H1b. Scarcity positively influences action regret.

While a purchased product represents value gained, it also represents a monetary sacrifice (Monroe, 2003). Therefore, the level of the future discount may also affect regret. Frank (2007) finds that price promotions can cause irrational consumption behavior, and a missed chance for a lower price can create negative emotions ranging from anger to guilt (Tykocinski & Pittman, 2004). According to EUT, consumers maximize utility when they incur the smallest sacrifice possible. Therefore, the realization that they did not maximize utility (i.e., overpaid) should result in feelings of disutility, in this case, regret. Specifically, a large future discount should result in a high action regret (i.e., the regret to have bought the product and to have missed out on a better price) while a low future discount should result in low action regret. Formally, the next hypothesis is as follows.

H2a. The size of the future discount positively influences action regret.

Using the logic of monetary sacrifice (Monroe, 2003), the level of discount should have an opposite effect on inaction regret. Consumers prefer to ensure that they obtain the product at a slightly higher price than miss out on it altogether (Gabler & Reynolds, 2013). Therefore, a small discount may cause more inaction regret because missing the product was not worth such a small financial gain. When the future discount is large, inaction regret (i.e., the regret not to have bought the product already or to have missed out on the product) should be low because loss of the product is worth the potential gain of a large savings. Formally, the next hypothesis is as follows.

H2b. The size of the future discount negatively influences inaction regret.

3.2. Materialism

Certain individuals place higher value on attaining material objects than others (Richins & Dawson, 1992). Materialism shares a foundation with self-control, or impulsivity (Rook, 1987), each of which is a personality trait influencing how individuals make purchase decisions. While self-control most certainly affects the shopping scenarios presented here, materialism, or the intrinsic value that individuals place on obtaining goods (Richins & Dawson, 1992), is of particular importance. Not only does it serve as a coping mechanism, it can often conflict with religious and family values (Burroughs & Rindfleisch, 2002). It can also provide or detract from personal happiness and well-being (e.g., La Barbera & Gürhan, 1997). In this study, materialism may help determine how a person reacts to the SID strategy as well as the regret stemming from a suboptimal purchase decision.

Materialistic individuals are likely to place a higher value on obtaining a product now versus waiting and saving money (Richins & Dawson, 1992). In this case the loss of the product would outweigh any gains in potential cost savings. Using this logic, materialism should lead to purchase for the simple reason that individuals who place more value on material goods will be less likely to risk missing something they desire. The opportunity cost of saving money by coming back later is not worth the risk of missing the item altogether. Alternatively, individuals who place less value on material products would be more likely to seek a lower price. These individuals may instead wait for the discount. Formally, the next hypothesis is as follows.

H3. Individuals high in materialism are more likely to purchase now than individuals low in materialism.

Materialism—regardless of purchase—may directly affect purchase decision regret. Materialistic individuals may experience higher inaction regret simply because they place more value on tangible things. They may also experience higher action regret because the extra money spent on the product could have bought more things. Alternatively, less materialistic individuals place less value on possessions as well as the ability to purchase more stuff. Therefore, regret from both missing the product itself and the discount should be less salient.

H4. Individuals high in materialism will experience greater purchase decision regret than individuals low in materialism.

3.3. Price consciousness

Price consciousness describes the process of evaluating the costs of goods and services as well as how freely individuals spend money (Zeithaml, 1988). Lichtenstein, Ridgway, and Netemeyer (1993) define it as "the degree to which the consumer focuses exclusively on paying a low price" (p. 235). Consumers translate prices into their own cognitive terms (Lichtenstein et al., 1988), and because this translation is not uniform, individual price perceptions differ even when the dollar amount is the same (e.g., Kukar-Kinney et al. 2012).

Individuals also place a different value on the time and effort they invest into a purchase decision (e.g., Alford & Biswas, 2002; Punj, 2012). Consumers who are highly price conscious believe it is *worth it* to shop around for the best prices (Kukar-Kinney et al. 2012) because it justifies the time and money spent in the search process (Lichtenstein et al., 1993). Alternatively, individuals with low price consciousness place more value on their search time and effort, which may outweigh achieving a lower price. For individuals with high price consciousness, a monetary loss from not getting the best deal should outweigh the gain of obtaining the product at a potential higher price. Therefore, in the SID strategy, individuals with high price consciousness should be more likely to wait for the sale price to take effect than those with low price consciousness. Formally, the next hypothesis is as follows.

H5. Individuals low in price consciousness are more likely to purchase now than individuals high in price consciousness.

Price consciousness should also influence purchase decision regret. Logically, highly price sensitive individuals may experience more regret when they realize they overpaid for a product. Because these individuals also place higher value on the time and effort they put into the search process (Alford & Biswas, 2002; Punj, 2012), they may also experience more regret when they miss the product altogether. In this case, all of their time and energy netted them nothing in return. Alternatively, by definition, less price conscious individuals are not as concerned with price, and therefore, should not regret overpaying. Formally, the next hypothesis is as follows.

H6. Individuals high in price consciousness will experience greater purchase decision regret than individuals low in price consciousness.

3.4. Action versus inaction regret

The omission bias has been a reliable behavioral predictor of how individuals approach utility (e.g., Baron & Ritov, 1994). Applying the omission bias to this research, a poor outcome based on action should lead to higher levels of regret than a poor outcome based on inaction (Spranca et al., 1991). However—critical to this study—the omission bias can reverse its direction when individuals have full knowledge of the alternative outcome (e.g., Ritov & Baron, 1995). Scholars have uncovered this reversal in a shopping context (e.g., Abendroth & Diehl, 2006; Simonson, 1992). In each case, the regret from inaction outweighs the regret from action, a phenomenon described by Zeelenberg et al. (2002) as the 'inaction effect'. We predict a similar response to the SID strategy. In general, the regret from missing the product itself (inaction regret) should be greater than the regret from missing the discount (action regret). While the latter consumer simply overpays for a desired product, the former leaves the scenario with nothing. Thus, the next hypothesis.

H7. Inaction regret will be higher than action regret.

4. Study 1

4.1. Sample and methods

Undergraduate marketing students recruited non-student respondents to complete an online CD-purchasing survey through a host survey website. This recruiting approach has been successfully used in the past (see e.g., Arnold & Reynolds, 2003; Henning, Gremler, & Gwinner, 2002). To ensure the quality of the data, the researchers provided detailed instructions to the students about the recruiting process. Students then contacted the respondents and provided them with the website address to access the survey. Non-student data tends to be more reliable, valid, and generalizable (Peterson & Merunka, 2014), and the recruitment technique has proven effective in prior research (Bitner, Booms, & Tetrault, 1990). The final sample ($N = 379$) contained 41% ($N = 157$) males and 59% ($N = 222$) females with an average age of 46 years (range 19–79).

While the SID strategy has several stages, this study uses just one stage to test the first two hypotheses. The goal is to understand the effects in a simple *buy versus not buy* decision before expanding to nuances at different stages. Following other decision-making research (e.g., Abendroth & Diehl, 2006; Gabler & Reynolds, 2013; Simonson, 1992), this study uses an Experimental Vignette Methodology (EVM) design. EVM is a proven valid and reliable research design utilized successfully for decades across disciplines to assess decision-making (see Aguinis & Bradley, 2014). Respondents imagine that they experience the events within a scenario generated by the principle investigators and respond as they would in real life.

Subjects first identified their favorite musical artist and the amount that they would pay for an album of that artist's first concert. Because second-hand shopping contexts (e.g., garage sales, consignment shops) often utilize discounting schedules, the scenario placed respondents at a Saturday flea market where they found that exact CD at the price identified. The survey informed the respondents that the flea market had a policy of selling any unsold items at a discount the following Saturday. Based on pre-testing, a 2×2 research design randomly assigned each subject to one of two scarcity conditions (high = 1 CD, low = 5 CDs) and one of two future discount conditions (high = 50%-off, low = 25%-off). Respondents had the choice to purchase the CD that day or come back next week to purchase it at the discounted price. The survey led the respondents to a page where they realized they made a suboptimal choice. Specifically, those who chose to buy the CD at full price returned to find a discounted CD available. They then answered a three-item action regret scale ($\alpha = 0.97$) based on Tsiros and Mittal's (2000) measure. Those who chose to wait for the discount returned to the flea market to find no CDs left before answering a three-item inaction regret scale ($\alpha = 0.98$) based on the same measure. The items for both regret scales were: 1) I would feel sorry for making my decision; 2) I would regret making my decision; 3) I would feel that I made a bad decision.

4.2. Analysis and results

Scale reliabilities and a confirmatory factor analysis confirmed that the data fit the proposed model. Manipulation checks ensured that

both scarcity and future discount were significantly different on each level ($p < 0.001$). Because participants answered either the action or the inaction regret items depending on their purchase decision, two path analytic models allowed for the analysis of hypotheses one and two. The first model examined the effect of discount and scarcity on inaction regret. The second model examined the effect of discount and scarcity on action regret. Both models result in good overall model fit (model 1: $\chi^2 = 10.02$ (3), $p = 0.018$, SRMR = 0.01; model 2: $\chi^2 = 6.38$ (3), $p = 0.09$, SRMR = 0.02). The results indicate a positive relationship between scarcity and both inaction regret ($M_{inaction\ regret} = 4.16$; $\beta = 0.18$, $p < 0.05$) and action regret ($M_{action\ regret} = 3.07$; $\beta = 0.18$, $p < 0.05$), supporting H1a and H1b. Contrary to expectations, the relationship between future discount and action regret was not significant (H2a; $\beta = -0.02$, *ns*). Finally, as hypothesized in H2b, a significant negative relationship exists between future discount and inaction regret ($\beta = -0.15$, $p < 0.05$).

4.3. Discussion

Study 1 had a simple purpose: provide a snapshot of how people react to the SID pricing schedule in a second-hand shopping context. The results suggest that the availability of a product plays a huge role in the regret – regardless of the purchase decision. Scarcity increased both the salience of action and the inaction regret. The discount level negatively influenced inaction regret, or those who did not purchase the product. By its nature, a smaller discount is less important, and in hindsight, it was not worth the risk of missing the product altogether. These are important implications of the SID strategy because it saddles firms with the dual responsibilities of monitoring the level of the discount as well as the number of products for sale. Interestingly, discount level had no effect on action regret. This surprising result could be context-specific. Consumers place more value on unique products (Lynn & Harris, 1997) and the CD offered in the scenario may be so valuable to some consumers (i.e., music aficionados) that discounts are irrelevant.

5. Study 2

5.1. Sample and methods

Study 2 is a natural continuation from study 1, utilizing a different context (department store) and product category (jeans), and utilizes the same EVM design (Aguinis & Bradley, 2014), where respondents make decisions based on a realistic shopping scenario. The study also includes materialism and price consciousness, as well as a moderate discount category to uncover the elasticity of the consumer responses. Once again, this scenario is a snapshot of the SID schedule, measuring one decision stage to relate the findings from study 1 to a more managerially relevant context. Similar to study 1, trained marketing students identified non-student subjects (Bitner et al., 1990) to ensure greater validity and reliability (Peterson & Merunka, 2014). Students then emailed their subjects with an embedded link to a secure website with the survey. The final sample ($N = 421$) consisted of 59% male and 41% female respondents with an average age of 31 (range 20–66).

Upon clicking the link, respondents read instructions and then answered a series of questions. Respondents imagined that they needed a new pair of jeans and identified their "go-to" brand as well as how much they would pay for a pair in "the exact style, fit, color, etc., that you are looking for." The survey then presented a department store shopping situation where they found that pair at that price. Based on pretests, the 2 × 3 design manipulated scarcity in high (2 pairs available) and low (10 pairs available) conditions as well as future discount in high (50%-off), moderate (25%-off), and low (10%-off) conditions. The host website randomly assigned one of the manipulation conditions to each respondent.

To measure purchase, the respondents answered yes or no to the statement "I would purchase a pair of jeans today." Next, the survey informed respondents that their choice, in retrospect, was wrong (Zeelenberg et al., 2000). Specifically, the survey told those who bought the jeans that they returned to find a pair at the discounted price and those who waited for the sale that they returned to find no pairs left. To measure purchase decision regret, respondents then answered three items based on Tsiros and Mittal's (2000) scale. Finally, the survey collected materialism and price consciousness using the scales of Richins and Dawson (1992) and Lichtenstein et al. (1993), respectively. Table 1 contains the three Likert-scale constructs as well as each variable's reliability and average variance extracted, as well as individual item factor loadings.

Confirmatory factor analysis assessed the reliability and validity of the scale items in the model and fit statistics indicate acceptable fit (χ^2 (51) = 74.09 ($p < 0.05$), CFI = 0.98, SRMR = 0.03, RMSEA = 0.03, AVE's > 0.5, SMC's > 0.5), per Hu and Bentler (1999) and Nunnally and Bernstein (1994). The constructs achieved discriminant validity as the average variance extracted by each construct was larger than any squared multiple correlations between constructs (Fornell & Larcker, 1981). Using a procedure by Armstrong and Overton (1977), early responders showed no significant differences to late responders, reducing concerns of timing bias. Finally, Rogelberg and Stanton's (2007) formula for non-response estimation demonstrated a *worst-case resistance* correlation that ensures that non-response bias is not an issue in this data.

5.2. Analysis and results

Examining the manipulations, participants in the high scarcity scenario described the jeans as significantly scarcer ($M = 4.5$; $t = 4.76$; $p < 0.001$) than those in the low scarcity scenario ($M = 3.67$). Similarly, respondents rated the discount levels significantly different at each level (F (2, 420) = 51.57; $M_{hi} = 5.38$, $M_{med} = 4.30$, $M_{low} = 3.42$). Because the model contains a categorical mediator but a continuous outcome variable, logistic regression with weighted least squares estimation allows us to evaluate all the relationships of interest in one model.

While not hypothesized, 63% ($N = 264$) of respondents decided to purchase the product. In support of past research, a positive significant relationship emerged between scarcity and purchase ($\beta = 0.15$, $p < 0.05$) while a significant negative relationship emerged between future discount and purchase ($\beta = -0.18$, $p < 0.05$). The model also demonstrated a significant positive relationship between materialism and both purchase ($\beta = 0.21$, $p < 0.001$) and purchase decision regret ($\beta = 0.29$, $p < 0.001$), supporting H3 and H4. While price consciousness had a significant negative influence on purchase ($\beta = -0.27$, $p < 0.001$), supporting H5, the results did not support H6. Price consciousness did not change purchase decision regret ($\beta = 0.09$, ns). Finally, an independent sample *t*-test assessed H7. Controlling the paths between scarcity and regret ($\beta = -0.01$, ns) as well as future discount and regret ($\beta = 0.21$, $p < 0.05$), this analysis revealed that respondents who did not purchase the jeans reported higher levels of regret (M = 3.69, $t = 2.10$, $p < 0.05$) than respondents who did (M = 3.34) (Table 2).

5.3. Discussion

Study 2 shifted from a flea market to a more traditional retail context to examine SID pricing. Adding a moderate level of discount as well as two personality trait variables, the scenario uncovered new paths to purchase decision regret. Materialism had a direct impact on purchase as well as the feelings of regret associated with that decision. As predicted, price consciousness also influenced the purchase decision. Those who were more price conscious were less likely to buy the product. However, price consciousness had no effect on regret, which means that a consumer's need to achieve low prices manifests more in the decision-making process (Lichtenstein et al., 1993) than the post-decision analysis. These results underscore the importance of managers understanding not just the product availability and discount schedule but

Table 1
Measurement model.

Constructs[a]	Items	Factor Loadings	AVE
Purchase decision regret ($\alpha = 0.94$); adapted from Tsiros and Mittal (2000)	I would feel sorry for making my decision.	0.92	0.83
	I would regret making my decision.	0.92	
	I would feel that I made a bad decision.	0.89	
Price consciousness ($\alpha = 0.93$); adapted from Lichtenstein et al. (1993)	The money saved by finding low prices is usually worth the time and effort.	0.88	0.76
	I am willing to go to extra effort to find lower prices.	0.93	
	The time it takes to find low prices is usually worth the effort.	0.90	
	I would shop at more than one store to find a low price.	0.78	
Materialism ($\alpha = 0.85$); adapted from Richins and Dawson (1992)	It is important to me to have really nice things.	0.73	0.54
	I would like to be rich enough to buy anything I want.	0.69	
	I'd be happier if I could afford to buy more things.	0.80	
	The things I own give me a great deal of pleasure.	0.75	
	It sometimes bothers me that I can't afford to buy all of the things I would like.	0.69	

[a] All items were captured with 7-point scales, disagree-agree scales.

their customers' characteristics as well. Finally, inaction regret trumped action regret in a predicted reversal of the omission bias. Individuals who decided to wait for the sale price experienced more regret when they came back to find no jeans available than those who paid more than necessary but still obtained the jeans.

6. General discussion

Looking through both a theoretical and managerial lens, studies 1 and 2 coalesce to present three contributions to the literature. First, EUT and the omission bias provide theoretical grounding to help understand the mechanisms at work in the SID pricing strategy. Second, study 1 uncovers that product scarcity increases regret in the SID context regardless of the purchase decision while the discount level only impacts non-purchase regret. Third, the antecedents of materialism and price consciousness act as drivers of the purchase decision in study 2, but only materialism increases the regret associated with a suboptimal decision. Taken together, this research extends the pricing literature while offering concrete implications for managers who wish to integrate SID into their pricing strategy.

6.1. Theoretical implications

Price plays an important role in consumer behavior (Kukar-Kinney et al. 2012). The current study advances pricing theory by applying the SID strategy (Gabler & Reynolds, 2013) to two different settings and product types. The concepts of scarcity (Jang et al., 2015; Aggarwal et al. 2011) and regret (Tsiros, 2009), as well as the theoretical underpinnings of EUT (cf. Mongin, 1997; Von Neumann & Morgenstern, 1947) and the omission bias (Spranca et al., 1991) add to the understanding of the optimal pricing schedule. When consumers face choices involving uncertain outcomes, they tend to make the decision that maximizes their utility. As seen in the current study, utility means different things to different people. To some, achieving a better deal garners the most utility. This means maximizing the cost-benefit relationship, or achieving the best result (i.e., product) while expending the least amount of resources (i.e., money). Others are less concerned with expending resources and derive more utility from the simple certainty of obtaining the desired product.

Table 2
Logistic regression results for study 2.

Path estimated	Model 1
H3: Materialism ➔ purchase	0.21^{***}
H4: Materialism ➔ purchase decision regret	0.29^{***}
H5: Price consciousness ➔ purchase	-0.27^{***}
H6: Price consciousness ➔ purchase decision regret	*ns*
Control path 1: Scarcity ➔ purchase	0.15^{*}
Control path 2: Discount ➔ purchase	-0.08^{*}

Note. Table values are unstandardized path estimates from the estimated model. $^{*}p < 0.05$. $^{**}p < 0.01$. $^{***}p < 0.001$.

This paper also answers three specific calls for research: Tsiros and Mittal's (2000) call to explore antecedents of regret; Tsiros and Hardesty's (2010) call to examine price expectations and inaction regret; and Grewal et al.' (2012) call to investigate individual difference factors in pricing situations. Specifically, study 1 examines two causes of each type of regret, finding that the fewer number of available products, the higher both action and inaction regret. Further—and counter to the hypothesis—when the future discount increases, inaction regret increases accordingly. This may be because in each case, the decision becomes riskier and, therefore, the regret reflects that escalated risk. Study 2 incorporates price consciousness and materialism to the theoretical understanding of SID. As predicted, materialism has a direct positive effect on purchase and the regret associated with the purchase decision in an SID context. Price consciousness does not influence purchase decision regret but does lead directly to the decision not to buy. These results underscore how individual characteristics shape loss aversion and the decision-making process.

Under the umbrella of EUT, the concept of omission bias adds insights into the mechanisms at work in the SID strategy. Scholars should acknowledge these findings, particularly within a changing retail environment (Grewal et al., 2012). The omission bias states that individuals judge negative actions as more harmful than negative inactions (e.g., Landman, 1987; Spranca et al., 1991). Applying this logic, individuals should regret making an overpriced purchase (an action) more than choosing not to buy and missing the product altogether (an inaction) (Kordes-de Vaal, 1996). However, the opposite holds true in this case. Overall, inaction regret is higher than action regret, meaning that SID pricing reverses the omission bias, which aligns with the 'inaction effect' uncovered by Zeelenberg et al. (2002). Theoretically, this demonstrates the difference between sociology and psychology literature, where the omission bias holds (Baron and Spranca 1997), and business disciplines where it does not. The justification for this finding is simple: respondents feel better when they get something – even an overpriced *something* – rather than nothing out of the scenario. This overlaps with the positive effects of goal attainment (e.g., Dellande, Gilly, & Graham, 2004) and converting a browser into a purchaser (e.g., Reynolds et al., 2012), which are both shown to increase satisfaction. It also aligns with the recent media trend of FoMO, or the Fear of Missing Out. More research will help academics understand why this effect runs counter to other decision-making contexts.

6.2. Managerial implications

Given the significant changes in the retailing environment and shopping behavior, retailers face more competition and challenges than ever

before (Rollins et al., 2014). Thus, firms need to adopt innovative pricing strategies, especially if they wish to compete with online retailers. One such strategy already in place is the Steadily Decreasing Discount (Tsiros & Hardesty, 2010), which provides managers with a means to maximize profits by bringing a discounted item back to its normal price via incremental steps. The results here indicate that the SID pricing strategy could serve as a dovetail to the Steadily Decreasing Discount, maximizing the front end of a product's shelf life by moving from the normal price to the lowest discount in the same incremental manner. In combination, these strategies optimize the revenue a firm can harvest from a given product.

Consumer shopping behavior has become more deliberate with an increasing amount of list-making, list-following, and pre-shopping research (Banjo & Germano, 2014), as well as a new emphasis on second-hand shopping (Grewal et al., 2012) and cherry-picking (Sharma, 2014). In addition, recent research has found that shoppers tend to prefer simple pricing (Homburg, Totzek, & Kramer, 2014). Many of these factors have led some analysts to proclaim "the end of the impulse shopper" (Banjo & Germano, 2014) and pose the question "Is browsing dead?" (Teachout, 2014). SID, then, presents a key advantage for managers looking to attract shoppers into their brick-and-mortar stores. Shoppers who decide to wait and purchase later must return to the outlet, generating more store traffic (Pan & Zinkhan, 2006). More traffic translates to more browsing, increased sales, satisfaction, and positive word-of-mouth (Reynolds et al., 2012).

This study also serves as a cautionary tale for managers. While SID may help move merchandise, a fine line exists between positively influencing purchase behavior and negatively altering attitudes toward the company. This analysis shows that managers should use caution when actively creating purchase decision regret. A missed bargain can prevent customers from purchasing at the normal price because it reminds them of the missed opportunity (e.g., Tsiros, 2009). Feelings of manipulation can also trigger inaction inertia (Zeelenberg et al., 2000). This research suggests that managers should let their customers anticipate regret (e.g., Simonson, 1992), but then allow them to avoid it by making the optimal decision.

As discussed, regret shares a theoretical underpinning with utility maximization. As one increases, the other tends to decrease. Individuals, however, are unique in how they maximize utility and minimize risk. Therefore, another implication for managers is to acknowledge that utility maximization means different things to different consumers, which translates to regret avoidance. For example, optimizing the price-quality relationship will minimize potential regret for some consumers while reducing time spent shopping minimizes regret for others. For others still, price may not enter the decision process at all. For managers, it is important, therefore, to tease out the characteristics of their customers before enacting a SID pricing model. For customers who prioritize material goods, the SID may maximize profits; but for price conscious customers, the SID could backfire. Not only may the firm experience lower purchase rates at the higher price intervals; feelings of regret may surface and prevent future patronage.

6.3. Limitations and future research

Aside from the usual risks associated with self-reported data, this study contains a few additional issues. While EVM design provided the optimal method to answer these questions (Aguinis & Bradley, 2014), individuals are often more cavalier with their money in hypothetical situations than in real life. In addition, the participants did not actually see the product, so interpretations of appearance and quality likely varied across the sample. Consequently, a laboratory or field experiment would help control for these nuances. In addition, the product choice in study 1 may have influenced the value of the future discount. Specifically, individuals show less price sensitivity when a product is unique (Lynn & Harris, 1997). Further, framing the scenario in terms of losses rather than gains may have induced more risky behavior than would be otherwise expected in an everyday shopping context. Study 2 reduced these concerns through a more typical shopping situation. Still, this does open the door for future research.

Replication of this study with different manipulations would make the results more robust. A longitudinal study that employed a multistage pricing schedule and gathered data at each interval would provide the most complete story of the SID pricing strategy and consumer reactions and emotions. Numerous variables not included here certainly shape how customers approach purchase situations under the SID pricing strategy. For example, would the number of remaining products change action regret? Do scarcity and discount affect consumer rejoicing in the same fashion as consumer regret? Does each type of regret lose salience over time at the same rate? Perhaps even demographic variables not considered here would influence the results. Questions like these could help scholars and managers understand the true effects of SID on the consumer decision process. Next, as mentioned, online shopping may be the most popular context for such a pricing schedule (Bodor et al., 2015), and a next logical step would be to test the effects identified in this research in the online shopping environment.

Finally, EUT guides the formation of the hypotheses explored here. While appropriate given the utility maximization principles under investigation, this neoclassical notion has its critics. Therefore, theoretical lenses may be helpful. For instance, prospect theory predicts that individuals weigh losses more heavily than corresponding gains in the decision-making process (Kahneman & Tversky, 1979). This principle may inform the purchase decision and resulting regret in this study. Specifically, by framing the scenario in terms of losses and gains, scholars could advance this research by asking two questions: which loss is more critical, the product itself or the discount? Similarly, which gain is more crucial, the product itself or the discount? Prospect theory is just one of many theories that could shed light onto not only why individuals choose to buy a product or wait for the discount but the purchase decision regret which may result.

References

Abendroth, L. J., & Diehl, K. (2006). Now or never: Effects of limited purchase opportunities on patterns of regret over time. *Journal of Consumer Research*, *33*(3), 342–351.

Aggarwal, P., Jun, S. V., & Huh, J. H. (2011). Scarcity messages. *Journal of Advertising*, *40*(3), 19–30.

Aguinis, H., & Bradley, K. J. (2014). Best practices recommendations for designing and implementing experimental vignette methodology studies. *Organizational Research Methods*, *17*(4), 351–371.

Alford, B. L., & Biswas, A. (2002). The effects of discount level, price consciousness and sale proneness on consumers' price perception and behavioral intention. *Journal of Business Research*, *55*(9), 775–783.

Armstrong, J. C., & Overton, T. S. (1977). Estimating non-response bias in mail surveys. *Journal of Marketing Research*, *14*(3), 396–402.

Arnold, M. J., & Reynolds, K. E. (2003). Hedonic shopping motivations. *Journal of Retailing*, *79*(2), 77–96.

Aydinli, A., Bertini, M., & Lambrecht, A. (2014). Price promotion for emotional impact. *Journal of Marketing*, *78*(4), 80–96.

Banjo, S. & Germano, S. (2014). The end of the impulse shopper. Wall Street Journal, November 25, 2014.

Baron, J., & Ritov, I. (1994). Reference points and omission bias. *Organizational Behavior and Human Decision Processes*, *59*(3), 475–498.

Baron, J., & Spranca, M. (1997). Protected values. *Organizational behavior and human decision processes*, *70*(1), 1–16.

Bell, D. E. (1982). Regret in decision making under uncertainty. *Operations Research*, *20*(September–October), 961–981.

Bitner, M. J., Booms, B. H., & Tetrault, M. S. (1990). The service encounter: Diagnosing favorable and unfavorable incidents. *Journal of Marketing*, *54*(1), 71–84.

Bodor, H. O., Klein, N. M., & Arora, N. (2015). Online price search: Impact of price comparison sites on offline price evaluations. *Journal of Retailing*, *91*(1), 125–139.

Burroughs, J. E., & Rindfleisch, A. (2002). Materialism and well-being: A conflicting values perspective. *Journal of Consumer Research*, *29*(3), 348–370.

Chung, J., & Li, D. (2013). The prospective impact of a multi-period pricing strategy on consumer perceptions for perishable foods. *British Food Journal*, *115*(3), 337–393.

Cialdini, R. B. (2008). *Influence: Science and practice* (5th ed.). Boston, MA: Pearson Education.

Coulter, K. S., & Roggeveen, A. (2012). Deal or no deal? How number of buyers, purchase limit, and time-to-expiration impact purchase decisions on group buying websites. *Journal of Research in Interactive Marketing*, *6*(2), 78–95.

Dellande, S., Gilly, M. C., & Graham, J. L. (2004). Gaining compliance and losing weight: The role of the service provider in health care services. *Journal of Marketing*, *68*(3), 78–91.
Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39–50.
Frank, R. H. (2007). *The natural economist: In search of explanations for everyday enigmas*. Ney York, NY: Basic Books.
Gabler, C. B., & Reynolds, K. E. (2013). Buy now or buy later: The effects of scarcity and discount on purchase decisions. *Journal of Marketing Theory & Practice*, *21*(4), 441–455.
Garaus, M., Wagner, U., & Kummer, C. (2015). Cognitive fit, retail shopper confusion, and shopping value: empirical investigation. *Journal of Business Research*, *68*(5), 1003–1011.
Grewal, D., Roggeveen, A. L., Compeau, L. D., & Levy, M. (2012). Retail value-based pricing strategies: New times, new technologies, new consumers. *Journal of Retailing*, *88*(1), 1–6.
Han, S., Gupta, S., & Lehmann, D. R. (2001). Consumer price sensitivity and price thresholds. *Journal of Retailing*, *77*(4), 435–456.
Henning, T. T., Gremler, D. D., & Gwinner, K. P. (2002). Understanding relationship marketing outcomes, an integration of relational benefits and relationship quality. *Journal of Service Research*, *4*(3), 230–247.
Hinterhuber, A. (2015). Violations of rational choice principles in pricing decisions. *Industrial Marketing Management*, *47*, 65–74.
Homburg, C., Totzek, D., & Kramer, M. (2014). How price complexity takes its toll: The neglected role of a simplicity bias and fairness in price evaluations. *Journal of Business Research*, *67*(6), 1114–1122.
Hu, L., & Bentler, P. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55.
Jang, W. E., Ko, Y. J., Morris, J. D., & Chang, Y. (2015). Scarcity message effects on consumption behavior: Limited edition product considerations. *Psychology and Marketing*, *32*(10), 989–1001.
Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263–291.
Kaltcheva, V., Winsor, R., Patino, A., & Shapiro, S. (2013). Impact of promotions on shopper price comparisons. *Journal of Business Research*, *66*(7), 809–815.
Kiran, V., Majumdar, M., & Kishore, K. (2012). Innovation in in-store promotions: Effects on consumer purchase decision. *European Journal of Business and Management*, *4*(9), 36–44.
Kopalle, P. K., & Lindsey-Mullikin, J. (2003). The impact of external reference price on consumer price expectations. *Journal of Retailing*, *79*(4), 225–236.
Kordes-de Vaal, J. H. (1996). Intention and the omission bias: Omissions perceived as nondecisions. *Acta Psychologica*, *93*(1), 161–172.
Kukar-Kinney, Monika, Ridgway, Nancy M., & Monroe, Kent B. (2013). The Role of Price in the Behavior and Purchase Decisions of Compulsive Buyers. *Journal of Retailing*, *88*(1), 63–71.
La Barbera, P. A., & Gürhan, Z. (1997). The role of materialism, religiosity, and demographics in subjective well-being. *Psychology and Marketing*, *14*(1), 71–97.
Landman, J. (1987). Regret and elation following action and inaction: Affective responses to positive versus negative outcomes. *Personality and Social Psychology Bulletin*, *13*(4), 524–536.
Lichtenstein, D. R., Bloch, P. H., & Black, W. C. (1988). Correlates of price acceptability. *Journal of Consumer Research*, *15*(2), 243–252.
Lichtenstein, D. R., Ridgway, N. M., & Netemeyer, R. G. (1993). Price perceptions and consumer shopping behavior: A field study. *Journal of Marketing Research*, *30*(2), 234–245.
Loomes, G., & Sugden, R. (1982). Regret theory: An alternative theory of rational choice under uncertainty. *The Economic Journal*, *92*(368), 805–824.
Lynn, M., & Harris, J. (1997). The desire for unique consumer products: A new individual differences scale. *Psychology and Marketing*, *14*(6), 601–666.
Mongin, P. (1997). Expected utility theory. *Prepared for the handbook of economic methodology* (pp. 342–350). London: Edward Elgar Publishing.
Monroe, K. B. (2003). *Pricing: Making profitable decisions* (3rd ed.). Burr Ridge, IL: Irwin.
Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY: McGraw-Hill.
Pan, Y., & Zinkhan, G. (2006). Determinants of retail patronage: A meta-analytic perspective. *Journal of Retailing*, *82*(3), 229–243.
Patrick, V. M., Lancellotti, M. P., & Demello, G. (2009). Coping with non-purchase: Managing the stress of inaction regret. *Journal of Consumer Psychology*, *19*(3), 463–472.
Peterson, R. A., & Merunka, D. R. (2014). Convenience samples of college students and research reproducibility. *Journal of Business Research*, *67*(5), 1035–1041.
Punj, G. (2012). Income effects on relative importance of two online purchase goals: Saving time versus saving money? *Journal of Business Research*, *65*(5), 634–640.
Reynolds, K. E., Jones, M., Gillison, S., & Musgrove, C. (2012). An investigation of retail outcomes comparing two types of browsers. *Journal of Business Research*, *65*(8), 1090–1095.
Richins, M. L., & Dawson, S. (1992). A consumer values orientation for materialism and its measurement: Scale development & validation. *Journal of Consumer Research*, *19*(3), 303–316.
Ritov, I., & Baron, J. (1995). Outcome knowledge, regret, and omission bias. *Organizational Behavior and Human Decision Processes*, *64*(2), 119–127.
Rogelberg, S. G., & Stanton, J. M. (2007). Understanding and dealing with organizational survey nonresponse. *Organizational Research Methods*, *10*(2), 195–209.
Rollins, M., Nickell, D., & Ennis, J. (2014). The impact of economic downturns on marketing. *Journal of Business Research*, *67*(1), 2727–2731.
Rook, D. W. (1987). The buying impulse. *Journal of Consumer Research*, *14*(2), 189–199.
Schneier, M. (2015). Lilly Pulitzer for target: They came, they waited, they went home mad. New York Times, April 22, 2015.
Sharma, R. (2014). Adapting to the new cherry-picking shopper. Wall Street Journal, November 25, 2014.
Simonson, I. (1992). The influence of anticipating regret and responsibility on purchase decisions. *Journal of Consumer Research*, *19*(1), 105–118.
Spranca, M., Minsk, E., & Baron, J. (1991). Omission and commission in judgment and choice. *Journal of Experimental Social Psychology*, *27*(1), 76–105.
Suri, R., & Monroe, K. B. (2003). The effects of time constraints on consumers' judgments of prices and products. *Journal of Consumer Research*, *30*(1), 92–104.
Teachout, T. (2014). Closing our browsers. Wall Street Journal, October 24, 2014.
Theotokis, A., Pramatari, K., & Tsiros, M. (2012). Effects of expiration date-based pricing on brand image perceptions. *Journal of Retailing*, *88*(1), 72–87.
Tsiros, M. (2009). Releasing the regret lock: Consumer response to new alternatives after a sale. *Journal of Consumer Research*, *35*(6), 1039–1059.
Tsiros, M., & Hardesty, D. M. (2010). Ending a price promotion: Retracting it in one step or phasing it out gradually. *Journal of Marketing*, *74*(1), 49–64.
Tsiros, M., & Mittal, V. (2000). Regret: A model of its antecedents and consequences in consumer decision making. *Journal of Consumer Research*, *26*(3), 401–417.
Tykocinski, O. E., & Pittman, T. S. (2004). The dark side of opportunity: Regret, disappointment, and the cost of prospects. *The Psychology of Economic Decisions: Reasons and Choices*, *2*, 179–196.
Uhler, J. (2014, May 12). *Cracking secret price codes at target, home depot, Costco*. Scripps Media, Inc (http://www.abcactionnews.com/money/consumer/taking-action-for-you/cracking-the-secret-price-codes-at-your-favorite-stores).
Von Neumann, J., & Morgenstern, O. (1947). *Theory of games and economic behavior* (2 ed.). Princeton, NJ: Princeton University Press.
Wang, R. J. -H., Malthouse, E. C., & Krishnamamurthi, L. (2015). On the go: How mobile shopping affects customer purchase behavior. *Journal of Retailing*, *91*(2), 217–234.
Zeelenberg, M., Kijk, W. W. V., Manstead, A. S. R., & Pligt, J. (2000). On bad decisions and disconfirmed expectancies: The psychology of regret and disappointment. *Cognition and Emotion*, *14*(4), 521–541.
Zeelenberg, M., van den Bos, K., van Kijk, E., & Pieters, R. (2002). The inaction effect in the psychology of regret. *Journal of Personality and Social Psychology*, *82*(3), 314–327.
Zeelenberg, M., Kees, V. D. B., van Dijk, E., & Rik, P. (2002). The Inaction Effect in the Psychology of Regret. *Journal of Personality and Social Psychology*, *82*(3), 314–327.
Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing*, *52*(3), 2–22.

Journal of Business Research 76 (2017) 209–218

Contents lists available at ScienceDirect

Journal of Business Research

Presenting comparative price promotions vertically or horizontally: Does it matter?

Shan Feng [b], Rajneesh Suri [a,*], Mike Chen-Ho Chao [b], Umit Koc [c]

[a] Drexel University, Gerri C. LeBow Hall, LeBow College of Business, Department of Marketing, 3141 Chestnut Street, Philadelphia, PA 19104, United States
[b] William Paterson University, Department of Marketing and Management Sciences, 1600 Valley Rd., Wayne, NJ 07470, United States
[c] Drexel University, Gerri C. LeBow Hall, LeBow College of Business, 3141 Chestnut Street, Philadelphia, PA 19104 , United States

ARTICLE INFO

Available online 13 January 2017

Keywords:
Comparative price promotions
Working memory
Math anxiety
Spatial price presentation

ABSTRACT

This research examines whether spatial differences in presentation of comparative price promotions (vertical vs. horizontal) affect consumers' assessment of price discounts. Results show that when comparative price promotions are presented horizontally, consumers take longer to compute the monetary discount and are less accurate than when such prices are presented vertically. This suggests that cognitive constraints exhibit a larger detrimental effect on performing computations when prices are presented horizontally than vertically. In addition, a constraint on visual resources impacts vertical presentations more while a constraint on verbal resources influences price computations that are presented horizontally.

1. Introduction

Consumers' price evaluations are subject to how retailers present their promoted prices. Recent research shows that consumers' assessment of sale price is influenced by color (Puccinelli, Chandrashekaran, Grewal, & Suri, 2013), and type and size of the fonts (Coulter & Coulter, 2005; Motyka, Suri, Grewal, & Kohli, forthcoming) used to present prices. Use of comparative price promotions that contrast regular with promoted sale prices to increase the likelihood of sale are also popular. A comparative price promotion relies on the regular price to act as a reference for evaluating the promoted price or discount (e.g., Regular Price (RP): $20, Sale Price (SP): $16; Regular Price: $20, Discount 20%). Such promotions have been shown to engender higher willingness to purchase than an offer that simply uses a sale price, primarily due to consumers' assessment of the price reduction and the computed discounted price (Compeau & Grewal, 1998; Della Bitta, Monroe, & McGinnis, 1981).

Recently Biswas, Bhowmick, Guha, and Grewal (2013) shows that comparative price promotions could be affected by the spatial location (left vs. right) of a sale price vis-à-vis its regular price. The location of a sale price in reference to its regular price assumes importance as it influences consumers' ability to compute the depth of a discount when performing calculations (Alba, Mela, Shimp, & Urbany, 1999; Biswas et al., 2013; Lichtenstein, Burton, & Karson, 1991). Generally, in a comparative price offer (RP – SP), the regular price (RP) will be the minuend, while sale price (SP) the subtrahend. However, in addition to determining the arithmetic difference between prices, the perceived difference between prices will also depend on the ease or difficulty with which consumers could compute price information (Thomas & Morwitz, 2009). When a comparative price conforms to a normative presentation that people expect to see when performing mathematical computations (RP – SP and not SP – RP; Biswas et al., 2013), it tends to make computations easier, and influences consumers' assessment of the discounted offer (Thomas & Morwitz, 2009). In a subtraction task for instance, Biswas et al. (2013) show that consumers find a larger minuend (regular price) displayed to the left of a smaller subtrahend (sale price) is easier to process as "people expect the 'normal' format to be one in which the smaller number appears to the right of the larger number" (pg. 51).

However, several retailers also offer comparative price promotions where a regular price is presented vertically above or below its sale price (e.g., macys.com; Amazon). So far research does not inform us if consumers will evaluate a comparative price promotion that is presented horizontally differently than if it was presented vertically. Hence, the research issue is whether a spatial difference in presentation of comparative price promotions (vertical vs. horizontal) affects consumers' perception of discounts and if so when?

This research builds upon the literature in education on students' approach to solving computation problems (Fuson & Briars, 1990) and the findings from Trbovich and LeFevre (2003) that participants tend to solve addition problems presented in a vertical format significantly faster and more accurately than problems presented in a horizontal format. Based on this literature it is proposed that when comparative price

* Corresponding author.
E-mail addresses: fengs1@wpunj.edu (S. Feng), surir@drexel.edu (R. Suri), chaoc@wpunj.edu (M.C.-H. Chao), Shb56@drexel.edu (U. Koc).

http://dx.doi.org/10.1016/j.jbusres.2017.01.003
0148-2963/

promotions are presented horizontally, consumers will compute monetary discounts less accurately than if such prices were presented vertically. Hence, consumers' assessments of discounts presented vertically will lead to a more accurate computation of the discount while a horizontally presented comparative price promotion will be perceived harder to process and will lead to lower perceived economic value (Thomas & Morwitz, 2009). Theoretical predictions are developed based on research on numerical processing and consumer learning of mathematical operations which suggests that people solve mathematical problems more accurately when the operands are presented vertically than horizontally. Further, since cognitive resources play a significant role in arithmetic computations (Ashcraft & Kirk, 2001; DeStefano & LeFevre, 2004) this research proposes the moderating effects of working memory and cognitive constraints on computation of discounts in comparative price offers. The following sections present a review of the literature on processing of numerical information leading to the predicted effects of spatial presentation of comparative price offers. These predictions are tested in five studies.

2. Conceptual development

In a comparative price promotion, consumers assess the promoted discount by relying on arithmetic calculation principles to mentally compute net prices and guide their price perceptions (Biswas et al., 2013; Grewal, Marmorstein, & Sharma, 1996). Increase in complexity of price presentations may reduce consumers' ability to systematically evaluate the discounts and form perceptions of the promoted offers and discounts (Estelami, 1999, 2003). However, computing the discount is only one way by which consumers may assess the attractiveness of an offer. Thomas and Morwitz (2009) report that a lack of processing ease also causes people to perceive the magnitude of the difference between two values as smaller. Consequently, assessment of comparative price promotions will depend not only on the arithmetic difference between prices but also on the ease or difficulty with which people process this difference.

Research suggests that numerical computations appear easier if their presentation formats conform to common norms as that makes such formats familiar and hence easier to process (Biswas et al., 2013; Yip, 2002). The issue then is whether certain numerical formats follow the norms and might allow a greater ease with which consumers can perform a subtraction task. Generally, when numbers are presented along a horizontal line, consumers expect to visualize a series of numbers with smaller numbers to the left while larger numbers towards the right (Dehaene, 1989). However, Biswas et al. (2013) observed results to the contrary when they compared the effectiveness of two types of horizontally presented comparative price displays. These displays differed in their presentation of the regular price (larger number) to the right (as a subtrahend) versus to the left (as a minuend) of the comparative sale price (smaller number; i.e., RP: $20, SP: $18 vs. SP: $18, RP: $20). Their studies found that presentations where the regular price appeared as a minuend was perceived easier to process and was preferred by consumers than when it appeared as a subtrahend. The contrast between vertical and horizontal presentation of comparative price promotions is discussed next.

2.1. Horizontal vs. vertical comparative price promotions

Interestingly, past research on the effectiveness of comparative price promotions has not only used stimuli where comparative prices were presented horizontally (e.g., Barone, Manning, & Miniard, 2004; Biswas et al., 2013) but also vertically (e.g., Coulter & Coulter, 2007; Thomas & Morwitz, 2009). However, in the extensive research on comparative price promotions, we know of no study that has examined whether comparative price promotions when presented vertically are evaluated differently than if they were presented horizontally. Dehaene's (1989); (Dehaene, Bossini, & Giraux, 1993) spatial-numerical association of response code (SNARC) effect on numerical processing discussed earlier was extended by Ito and Hatta (2004). These researchers observed a vertical SNARC with larger numbers occupying the top and smaller numbers the bottom of an internal representational space. Consistent with expectations from vertical SNARC, a study on merchandizing by Valenzuela and Raghubir (2015), shows that consumers expect higher (vs. lower) priced brands to be merchandized on the top (vs. bottom) shelves in retailing settings. Similarly, in numerical processing research, it is found that people generally expect to see large numbers at a higher elevation and small numbers at a lower elevation in the visual field (Gevers, Lammertyn, Notebaert, Verguts, & Fias, 2006; Schwarz & Keus, 2004). Therefore, when two numbers are presented vertically, like in a vertical comparative price display, the larger number (regular price) is expected to be on top of the smaller number (sales price). Though research on SNARC effects provides insights on suitable placement of numbers in space, it provides only limited insights into the effects of presentation of comparative prices. This research indicates that people expect a smaller number to appear below a larger number. If it meets this expectation then vertically presented comparative price promotions should be perceived easier to compute when the minuend is larger (i.e., regular price) and placed above the subtrahend (i.e., sale price).

The literature on education and numeric processing provides further understanding of how different comparative price presentations (vertical vs. horizontal) will impact consumers' computations of the final price or the discount. Arithmetic problems in school texts are often presented vertically (Fuson & Briars, 1990). For instance, when asked to solve addition and subtraction problems presented vertically or horizontally, some children found it necessary to rewrite in vertical form for problems presented horizontally (Goodrow, 1998). By recording eye movements, research on individuals' reading speed for horizontal and vertical English texts suggest that the reading speed is significantly higher in the horizontal direction than in the vertical direction (Schmidt, Ullrich, & Rossner, 1993; Yu, Park, Gerold, & Legge, 2010). Though easier to read, horizontal direction is more difficult to scan than vertical direction and this is because all items are aligned to the same line in a vertical presentation but do not match up in a horizontal presentation. Such a match helps in computing differences between two numbers or performing computations as is often the case involving comparative price promotions. Hence, when numbers are arranged in a horizontal line, consumers may find it harder to process them accurately than for numbers that are aligned vertically.

Consistent with the above conclusions, Trbovich and LeFevre (2003) found that participants solved addition problems presented in a vertical format significantly faster and more accurately than problems presented in a horizontal format. Heathcote (1994); (Brysbaert, Fias, & Noël, 1998) further suggests that an alignment of the unit digits in vertical presentations will result in shorter response latencies and higher accuracies for vertical presentations. Using both subtraction and multiplication operations, Imbo and LeFevre (2010) found support for the computation results observed by Trbovich and LeFevre (2003).

Since people are cognitive misers (Taylor, 1980) and solving arithmetic problems requires cognitive resources (DeStefano & LeFevre, 2004), comparative price presentations that are perceived difficult to process due to a lack of spatial alignment of numbers will require more cognitive resources leading to their computations to contain more errors (Baddeley, 1992, 2001; Miyake & Shah, 1999). In essence, when consumers compute comparative price promotions, cognitive resources are required to perform a series of mental computations, including calculating operands at the units, tens and hundreds places, borrowing, retention of the intermediate result, and generation of a phonological code (Widaman, Geary, Cormier, & Little, 1989). The ability to perform these mental activities depends on how a comparative price promotion is presented (Vanhuele, Laurent, & Dreze, 2006). Due to previous math learning habits and the differences in alignment of digits in vertical and horizontal price presentations, a vertical

presentation of comparative price promotions will allow greater ease when computing price differences compared to when these prices are presented horizontally. More formally, the first hypothesis is as follows. H1: Computation of comparative price promotions presented vertically will be more accurate and faster, compared with comparative price promotions that are presented horizontally.

3. Study 1: comparative price promotions and response accuracy

In this study participants computed absolute differences between two prices that were presented vertically or horizontally. It is expected that vertical price displays should encourage quicker and more accurate computation of dollar differences between regular and sale prices than horizontal price displays.

3.1. Method

The comparative price promotions were presented using a response time software. A vertical price offer presented the sale price as a subtrahend (below) or minuend (above) for the accompanying regular price. On the other hand, a horizontal comparative price offer depicted the sale price to the left (as minuend) or the right (as subtrahend) of the regular price. Participants were randomly assigned to one of the conditions in the 2 (spatial presentation: horizontal vs. vertical) × 2 (sale price location: minuend vs. subtrahend) between subjects design.

Four comparative price offers were presented individually and participants mentally computed the discount (in dollars) for each comparative price offer in the absence of any computing tools (see Appendix 1). The tasks were embedded in another un-related study, and the prices were presented in a random order on computers equipped with response time measurement software. We asked participants to be quick while being accurate as they computed the offers mentally. Eighty-four students (M_{age} = 20.2 years, 48% women) from a large, private, east coast U.S. university participated in the study for course credit. A practice task helped the participants become familiar with the task.

3.2. Results and discussions

As expected, when computing such discounts, participants responded faster when such comparative price promotions were presented vertically than horizontally ($M_{vertical}$ = 28.872 ms, $M_{horizontal}$ = 33.657 ms, $t(82) = 2.08$, $p = 0.04$). Consistent with our prediction, they also exhibited greater accuracy (accurate = 1; inaccurate = 0) when computing prices presented vertically ($M_{vertical}$ = 3.8, $M_{horizontal} = 2.8$, $t(82) = 4.13$, $p < 0.001$). These results support the preference for price computations that are presented vertically than horizontally. Also, though participants spent more time computing prices presented horizontally they still computed the discounts less accurately than when the prices were presented vertically (Table 1a).

Similarly participants responded faster when computing the discount where sale prices were presented as subtrahends (i.e., towards the right or below the regular price) than as minuends (i.e., towards the left or above the regular price; $M_{subtrahend}$ = 28.374 ms, $M_{minuend}$ = 34.150 ms, $t(82) = 2\ 0.55$, $p = 0.013$). Also, comparative price promotions were computed more accurately when the sale price was presented as a subtrahend (i.e., towards the right of the regular price) than as a minuend ($M_{subtrahend}$ = 3.5, $M_{minuend}$ = 2.9, $t(82) = 2.05$, $p = 0.04$) (Table 1b).

Table 1a
Study 1 comparative price promotions and response accuracy.

Price alignment	Response time		Computation accuracy	
	M	SD	M	SD
Vertical	28,872 ms	9949	3.8	0.38
Horizontal	33,657 ms	11,014	2.8	1.50

Table 1b
Sale price location and response accuracy.

Sale price location	Response time		Computation accuracy	
	M	SD	M	SD
As subtrahends	28,374 ms	9620	3.5	0.96
As minuends	34,150 ms	11,080	2.9	1.43

The results from this study suggest that numerical information is processed more accurately when it is presented in a normative manner, i.e., when a smaller subtrahend (sale price) follows a larger minuend (regular price) and more importantly, when the subtrahend is either below or to the right of the minuend. Further, comparative price promotions were computed more accurately and quickly when they were presented vertically than horizontally.

4. Study 2A: cognitive resources and comparative price promotions

Though study 1 shows a difference in speed and accuracy for computations that differ in spatial presentation, the differences in cognitive resources that underlie such processing can only be inferred. To examine differences in cognitive resources required when processing vertically versus horizontally presented comparative price promotions, this study adapted the procedure used in Ashcraft and Kirk (2001); (Suri, Monroe, & Koc, 2013) and used participants' anxiety towards computations, that is, math anxiety (Richardson & Suinn, 1972), as a surrogate for the extent of available cognitive resources. Specifically, anxiety towards computations has been shown to interfere with solving mathematical problems and drain cognitive resources (Ashcraft & Faust, 1994; Feng, Suri, & Bell, 2014). For computations requiring greater cognitive resources, a lack of available resources would manifest as an inferior computational performance. Such an effect on performance is expected for those with high math anxiety (Suri et al., 2013). As demonstrated in study 1, compared to comparative price promotions presented vertically, those presented horizontally are more difficult to compute and thus require more cognitive resources. Consequently, math anxiety will impede computations of comparative price promotions more when they are presented horizontally than vertically, thus supporting the impact of available cognitive resources on differences in processing of the two spatial presentations. In essence, compared to individuals with low math anxiety, those with high math anxiety will find it harder (slower and more inaccurate) to compute comparative price promotions that are presented horizontally than vertically.

The methodology was similar to study 1, and participants computed the discounts in dollars for 6 comparative price offers that were embedded in another unrelated task. These prices were presented in a random order on computers equipped with response time measurement software. These comparative offers also differed from those used in study 1, in that sale prices were only presented as subtrahends either below (vertical presentation) or to the right (horizontal presentation) of regular prices. Participants were randomly assigned to one of these two spatial price conditions (horizontal vs. vertical) and after responding to the survey, completed the short version of the math anxiety rating scale (sMARS; Alexander & Martray, 1989) as part of a battery of lifestyle measures. The sMARS is a 25-item measure of the 98-item math anxiety scale (MARS). The sMARS assesses an individual's level of apprehension

and anxiety about math on a 0 ("not at all") to 4 ("very much") scale. Participants indicate how anxious they would be in various settings and experiences (e.g., "Reading a cash register receipt after you buy something"). It correlates highly with MARS ($r = 0.96$) and has a test-retest reliability of $r = 0.75$ at a two-week retest interval (Alexander & Martray, 1989; Ashcraft & Kirk, 2001).

One hundred and thirty-four students ($M_{age} = 21.54$ years, 55% women) from a large, private, east coast U.S. university participated in the study for course credits. A practice task helped the participants become familiar with the task.

4.1. Results

Similar to study 1, participants computed the discounts faster when comparative price promotions were presented vertically than when they were presented horizontally ($M_{vertical} = 48.506$ ms, $M_{horizontal} = 53.759$ ms, $t(132) = 2.03$, $p = 0.06$). Also consistent with our predictions, participants exhibited greater computation accuracies when comparative price promotions were presented vertically ($M_{vertical} = 5.77$, $M_{horizontal} = 5.46$, $t(132) = 2.17$, $p < 0.05$). From those that responded accurately, the vertical price presentations were more accurately computed (86%) than the horizontal presentations (65%: χ^2 (1) = 7.87, $p = 0.005$).

Furthermore, the regression revealed a significant math anxiety × spatial price presentation ($\beta = -0.87$, $t = 2.59$, $p = 0.011$). Accuracy of computations dropped with increasing math anxiety when the price information was presented horizontally ($\beta = -0.37$, $t = 3.12$, $p = 0.003$) than when the prices were presented vertically ($\beta = 0.10$, $t = 0.83$, $p = 0.41$) (Table 2).

5. Study 2B: price presentations and value perceptions

Study 2b replicated the results of study 2a with a non-student sample obtained using Amazon Mechanical Turks (AMT). Participants were presented with an advertisement for a new product (Aura Visor) adapted from the Kickstarter website (Appendix 1). Extending the results from study 2a where participants computed prices, in this study, participants indicated their perceptions of value for the promoted offer (At the sale price this product is very good value for money; the product appears to be a good deal; 7-point scale; strongly disagree to strongly agree; $r = 0.79$, $p < 0.001$). It is expected that a heightened perception of difficulty in computing the prices will lead to a lower perceived value for the offer (Thomas & Morwitz, 2009). The comparative price promotion for the product (Regular Price: $136, Discount: $34) was presented either horizontally or vertically and was embedded in another unrelated task as part of a larger data collection. At the conclusion of the study all participants completed the sMARs (M = 62.19, SD = 26.07).

Sixty-four participants ($M_{age} = 34.31$ years; 48% female) recruited on AMT were assigned randomly to one of the 2 price presentation conditions (vertical, horizontal). A majority of the participants (65.6%) had 5 years or more of education beyond high school with 76.6% of all participants having an annual income exceeding $24,000.

5.1. Results

Regression analyses revealed a significant math anxiety × spatial price presentation effect ($\beta = -0.92$, $t = 2.05$, $p = 0.04$). The perceptions of value dropped with increasing math anxiety when the comparative price information was presented horizontally ($\beta = -0.51$, $t = 3.25$, $p = 0.003$) than when it was presented vertically ($\beta = -0.03$, $t = 0.18$, $p = 0.86$).

Table 2
Study 2a cognitive resources and comparative price promotions.

Price alignment	Response time		Computation accuracy	
	M	SD	M	SD
Vertical	48,506 ms	13,668	5.77	0.59
Horizontal	53,759 ms	16,147	5.46	1.0

5.2. Discussion

The results from studies 2a and 2b show that those with constrained cognitive resources (i.e., high math anxiety) exhibit greater difficulty when computing comparative price discounts that are presented horizontally and lead to significantly higher perceptions of value for the promoted offers. However, the impact of constraints on cognitive resources was not manifested when price computations were presented vertically suggesting a relative cognitive ease of processing such presentations.

Other research suggests that in addition to attitudes towards mathematics (observed in studies 1 & 2b), outcomes of computations may also be impacted by a problem's complexity. Morwitz, Greenleaf, and Johnson (1998, Study 2) found that participants had cognitive difficulty when processing percentages and computed total costs of an offer more accurately when computations were in dollars rather than in a percentage form. Hence, consumers processing comparative price presentations using percentages would exhibit higher constraints on cognitive resources than those processing a subtraction task observed in studies 1, 2a and 2b. This is because when a higher number of steps are required for solving a math problem it increases demands on working memory (Ashcraft & Kirk, 2001; Imbo & LeFevre, 2009; Suri et al., 2013). Hence, compared to tasks involving subtraction only, when a subtrahend uses a percentage form (Regular Price: $20, Discount: 20% off Regular Price), the operands used to arrive at a final sale price will suggest a combination of subtraction, multiplication and division processes that will increase the demands on cognitive resources. Studies 3a and 3b examine the effects of math anxiety when comparative price computations required to arrive at the final price use a percentage-off (vis-à-vis a comparative regular price) subtrahend. This study execution will replicate spatial effects of price presentations to another operand used in comparative price promotions. In addition, a more nuanced role of working memory is examined and developed below.

5.3. Comparative price promotions and nature of working memory

Consistent with Dehaene' (1992) triple-code model which suggests that numbers can be mentally represented and manipulated in an Arabic code, an auditory verbal code, and an analogue magnitude code, Vanhuele et al. (2006) showed that consumers encode and store price information verbally and visually. According to the memory model proposed by Baddeley (2000); (DeStefano & LeFevre, 2004), people rely on both verbal and visual working memory resources to process given information while performing calculations (Fürst & Hitch, 2000; Seitz & Schumann-Hengsteler, 2000) and to retain operands and intermediate results during computations (DeStefano & LeFevre, 2004; Imbo & LeFevre, 2010).

Furthermore, Trbovich and LeFevre (2003) showed that for the horizontally presented problems, a squeeze on the verbal working memory resources (phonological load) had a larger detrimental effect on performance, suggesting that computing horizontally presented arithmetic problems exhibited a reliance on the verbal (phonological) resources in working memory. In contrast, vertically presented computations were less affected by a verbal constraint but more by a constraint on visual working memory resources. That is, visuo-spatial codes in working memory are active more strongly for problems presented in vertical

formats (Baddeley, 2000). Essentially, vertically presented arithmetic problems activate a solution algorithm wherein each column of numbers is processed sequentially, and hence requires more visual resources than problems presented horizontally. On the other hand, horizontally presented problems are more likely to be impacted by constraints on verbal resources. Using subtraction and multiplication operations, Imbo and LeFevre (2010) found support for the results in Trbovich and LeFevre (2003).

5.4. Role of math anxiety

Past research on the relationship between math anxiety and working memory support the idea that worry characteristic of such an anxiety consumes cognitive resources in an ongoing cognitive task, resulting in a slowing of performance and a decline in accuracy (Ashcraft & Kirk, 2001; Eysenck & Calvo, 1992). A squeeze on one's cognitive performance due to worries about computations would depend upon the nature of memory resources needed by a computation task (Trbovich & LeFevre, 2003). Since computations of comparative price promotions that are presented horizontally relies on verbal (phonological) resources in working memory, a competing demand on verbal resources will negatively impact computations of prices presented horizontally but not vertically (Carlson, 1997; Ikeda, Iwanaga, & Seiwa, 1996; Miyake & Shah, 1999). On the other hand, since vertically presented comparative price promotions place demands on visuo-spatial resources in working memory, a competing demand on visual resources will be detrimental to computations of vertically but not horizontally presented prices. Though Suri et al. (2013) show an interference of price computations due to math anxiety, the spatial presentation of comparative price promotions and the role of different aspects of working memory was not a focus of that research. In addition, the stimuli used in their study presented numeric information horizontally. Such competition for cognitive resources will possibly make the computation response slower, as in studies 1 and 2a. Previous conceptualization suggests that math anxiety will impact the evaluation of both vertically and horizontally presented comparative price promotions, as follows. H2a: When comparative price promotions are presented horizontally, increasing math anxiety will impede price computation performance more when such price presentations are accompanied by a verbal load, compared with a visual load. H2b: When comparative price promotions are presented vertically, increasing math anxiety will impede price computation performance more when such price presentations are accompanied by a visual load, compared with a verbal load.

6. Study 3A: comparative price presentation and working memory

6.1. Method

6.1.1. Stimuli

Past research on working memory has adopted the use of pronounceable consonant-vowel-consonant (CVC) non-words (e.g., gub, nof, sul) as a source of verbal memory load while using a pattern of asterisks arranged in a 5 × 5 array to create a visual memory load (e.g., TrBovich & LeFevre, 2003). However, such manipulations of working memory are not relevant to real world market communications. Consumers rarely see patterns of asterisks or are exposed to CVC nonwords when evaluating marketing communications. To address this issue, we used an actual product and created a different procedure to create verbal and visual loads. To avoid potential confounding effects of product familiarity or product knowledge, a new product at the time of the study from Kickstarter website, "tile", a tiny Bluetooth tracker for personal belongings, was selected as the focal product.

To create the visual memory load condition, we used the product's image along with 5 additional images from the product's website. These images helped depict product attributes in pictorial forms. To create the phonological/verbal memory load condition the same product advertisement was modified to describe the attribute images used in the visual load condition (see Appendix 2).

6.1.2. Procedure

Upon arrival at the behavioral lab, participants were informed that the objective of the study was to evaluate marketing communications. Participants were asked not to use any computation aids including calculators and cell-phones, and put aside all paper-pencils during the study. The stimuli were presented on computers and the presentation software measured the response time.

The focal stimuli were embedded in a cluster of other stimuli for an unrelated study where participants provided feedback on non-price attributes. The focal stimuli were displayed for 45 s. The participants were asked to memorize the advertised information as they would be asked to recall that information later. Then they were presented with the promotion information that accompanied either the visual or the verbal load conditions. Participants were asked to keep the given information (words and pictures) in memory while reviewing the advertisement. Specifically, in the verbal (visual) load condition, participants were instructed to subvocally rehearse and remember the described product attributes (visually presented attributes of the product) while they computed the final price. Participants were asked to place equal emphasis on both the memorization of attributes and the price computation tasks. After the allocated time, participants responded to questions about the product attributes. Participants completed a practice session with a different product (Amazon kindle) to help them familiarize with the task and then were reminded about the objectives of the study and the need to respond quickly and accurately. Finally, the participants completed the sMARS.

Two hundred and thirty-three students at a northeastern U.S. university participated in the study for extra credits. They were randomly assigned to one of the conditions in the 2 (price presentations: vertical vs. horizontal) × 2 (working memory load: visual vs. verbal) between subjects design.

6.2. Results

Six participants were excluded from the final analyses because their response times for price computations or the total time to complete the study were >3 standard deviations away from the mean response time or provided inconsistent responses (e.g., "straightlining"). Thus, the final sample consisted of 227 respondents (M_{age} = 22.1 years, 47% women). Excluding the 6 participants did not change the pattern of results.

Similar to studies 1 & 2a, participants computed the discount faster when the comparative price information was presented vertically than when it was presented horizontally ($M_{vertical}$ = 18.1 s, $M_{horizontal}$ = 21.5 s, $t(225) = -1.9$, $p = 0.06$).

Regression revealed a significant math anxiety × spatial price presentation interaction on response time to compute the net price ($\beta = 0.114$, $t = 1.9$, $p = 0.04$). This result stemmed from response times to compute the net price increasing with math anxiety when the comparative price information was presented horizontally ($\beta = 0.19$, $t = 2.1$, $p = 0.04$) than when it was presented vertically ($\beta = 0.005$, $t = 0.05$, $p > 0.10$).

Of those who accurately computed the net price, when prices were presented vertically, response times for computations increased with increasing math anxiety in the visual load ($\beta = 0.28$, $t = 1.88$, $p = 0.06$) but not in the phonological load condition ($\beta = -0.09$, $t = -0.68$, $p > 0.10$). On the other hand, when price information was presented horizontally, the time to compute increased significantly with increasing math anxiety in the phonological load ($\beta = 0.34$, $t = 2.57$, $p = 0.01$) than in the visual load condition ($\beta = 0.26$, $t = 1.77$, $p > 0.10$).

However, given that there was only one price calculation task in the study, there was no significant effect of price presentation

format, working memory load, or math anxiety on the error in computing the net price. This result was not surprising since participants were allocated sufficient time to process the focal stimuli (45 s), compared to the observed average time taken (19.8 s) by all participants.

7. Study 3B: comparative price presentations and purchase likelihood

All studies reported so far, except study 2b, have examined the effects of comparative price promotions on price computations and response times. Study 3b extends these results by examining the impact of price presentations on consumers' willingness to purchase. It is expected that an increased perception of difficulty in computing the prices will lead to a lower willingness to purchase the offer (Thomas & Morwitz, 2009). Following the empirical results observed in the previous studies, it is expected that a visual load would impair purchase intentions of vertical presentations while a verbal load would reduce purchase likelihood for horizontally presented comparative price promotions. These effects are tested with an online consumer sample collected using Amazon's Mechanical Turks (AMT).

7.1. Method

7.1.1. Stimuli

The study materials and procedures replicated those used in study 3a with two key modifications. First, in addition to the "Tile," a second product (Ski bundle) was included based on the results of a pretest. Second, participants were asked to indicate their willingness to purchase (I am likely to purchase this product; I am likely to purchase this product at the advertised price; $r_{ski} = 0.86$, $r_{Tile} = 0.93$, p's < 0.001) and their perceived ease when computing net prices in the two comparative price promotions (price displays made it easy to determine the final price: 7-point scale; strongly disagree/strongly agree).

7.1.2. Procedure

The procedure followed that used in study 3a and the two product promotion offers were randomly presented to participants. These two product descriptions were embedded in three additional filler product communications that were not germane to this investigation. Participants were informed that the objective of the study was to evaluate the advertisements. The manipulations of verbal and visual memory load were similar to those used in study 3a.

One hundred and twelve participants ($M_{age} = 36.12$ years; 51% female) recruited on AMT were assigned randomly to one of the 2 (price presentations: vertical vs. horizontal) × 2 (working memory load: visual vs. verbal) between subjects design. A majority of the participants (65.1%) had 5 years or more of education beyond high school with 71.4% of participants having an annual income exceeding $24,000.

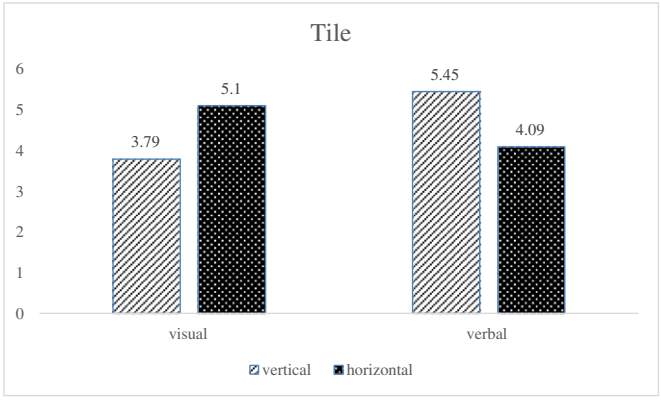
7.2. Results

Consistent with the results observed in the other studies reported here, there was a significant interaction effect between price presentation format and memory load on the willingness to purchase (Ski bundle: $F(1, 108) = 13.75$, $p < 0.0001$; Tile: $F(1, 108) = 20.20$, $p < 0.0001$). For horizontally presented price promotions accompanying a visual load, participants showed higher willingness to purchase such offers than when the comparative price information was presented vertically (Ski bundle: $M_{vertical} = 3.63$, $M_{horizontal} = 5.15$, $F(1, 57) = 10.54$, $p = 0.002$; Tile: $M_{vertical} = 3.79$, $M_{horizontal} = 5.10$, $F(1, 57) = 9.30$, $p = 0.003$). Contrastingly, for the advertised offers accompanied by a verbal load, the willingness to purchase was higher for the vertically presented comparative price promotions (Ski bundle: $M_{vertical} = 5.15$, $M_{horizontal} = 4.23$, $F(1, 51) = 4.05$, $p = 0.05$; Tile: $M_{vertical} = 5.45$, $M_{horizontal} = 4.09$, $F(1, 51) = 11.36$, $p = 0.001$). (See Fig. 1)

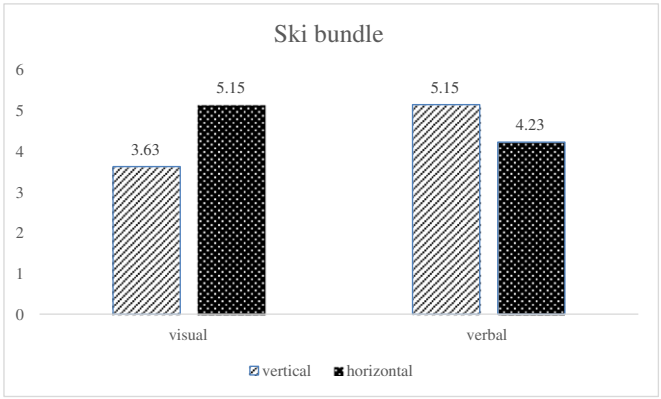
In addition, respondents also indicated their perceived ease of processing for the presented offers in the study. This purpose of this measure was to elicit participants' general response to price computations presented vertically or horizontally. The ANOVA revealed significant interaction between price presentations and memory load on the perceived ease in computing net price ($F(1, 108) = 32.60$, $p < 0.0001$). There were also main effects of memory load ($F(1, 108) = 9.82$, $p = 0.002$) and price presentation ($F(1, 108) = 12.64$, $p = 0.001$). Specifically, the comparative price presentations were perceived easier to compute when prices were presented vertically than horizontally ($M_{vertical} = 6.17$, $M_{horizontal} = 5.51$, $F(1, 110) = 6.21$, $p = 0.014$) and when the accompanying load was visual than verbal ($M_{visual} = 6.12$, $M_{verbal} = 5.57$, $F(1, 110) = 4.28$, $p = 0.04$).

7.3. Discussion

Hence study 3b replicated the results observed in the other studies reported here. Essentially, the willingness to pay was higher for promotions that accompanied the memory load that did not impede processing of price information in such offers. In essence, horizontally presented offers resulted in higher willingness to purchase when accompanied by a visual presentation of attributes while the vertically presented comparative price promotions showed a higher willingness to purchase when accompanied by a verbal description of attributes.



a: Comparative Price Presentations and Purchase Likelihood for Tile



b: Comparative Price Presentations and Purchase Likelihood for Ski bundles

Fig. 1. a: Comparative price presentations and purchase likelihood for tile. b: Comparative price presentations and purchase likelihood for Ski bundles.

Using a non-student sample and direct measures of purchase likelihood and perceived ease in computing price presentations further confirmed the results observed in earlier studies (1–3a).

8. General discussion

Past research indicates that consumers' evaluation of a comparative price promotion depends on how price information is presented. A review of online and catalog retailers indicates that comparative price promotions can be presented either vertically or horizontally. This current research examined whether consumers will evaluate a comparative price promotion that is presented horizontally differently than a vertical presentation. Specifically, this research examined whether a spatial difference in presentation of comparative price promotions (vertical or horizontal) leads consumers to compute discounts quickly and accurately and consequently affects their evaluation of the offer. Findings from five studies reported here suggest that compared to a horizontal presentation format, a vertically presented comparative price promotion is easier to process, and leads to faster and more accurate computations. Furthermore, math anxiety provides a nuanced understanding of the role of cognitive resources and how such constraints compete with an ongoing price computation task. It is further demonstrated that price computations involve the use of both visual and phonological resources in working memory. Vertically presented comparative price presentations rely more on visuo-spatial resources. However, comparative price promotions presented horizontally rely more on verbal memory resources. These findings have both theoretical and managerial implications.

The results of the present study provide additional theoretical context for prior research on comparative price promotion. First, the results of study 1 showed support for the findings by Biswas et al. (2013) in that a horizontal price presentation where the sale price appeared as a subtrahend tends to be easier to process than when it appeared as a minuend. Further, this research is the first attempt to compare the effects of horizontal versus vertical comparative price displays on consumer's computation performance and extend the "subtraction principles" proposed by Biswas et al. (2013) to comparative price promotions presented vertically. Secondly, it has been suggested that the effectiveness of comparative price promotions may stem from consumers' assessment of the price reduction and consequently the discounted price (Compeau & Grewal, 1998; Della Bitta et al., 1981). All five studies reported here show that, compared to a horizontal price presentation, a vertical price presentation allows for more accurate and faster arithmetic computations. Hence, a vertical comparative price might be more effective in stimulating consumers to compute net prices and notice the economic value of such offers (study 3a & 3b). Thirdly, consumers show longer price computation times and are more error prone when comparative price promotions are presented horizontally (studies 1, 2a, & 2b). Such findings are also consistent with prior research in that an increase in complexity of price presentations may further reduce consumers' ability to systematically evaluate the discounts and form perceptions of the promoted offers and discounts (Estelami, 1999, 2003; Thomas & Morwitz, 2009).

This present research also contributes to the numerical processing literature by identifying two moderators in a price computation task, math anxiety and working memory. Solving arithmetic problems requires cognitive resources (DeStefano & LeFevre, 2004; Widaman et al., 1989). Negative feelings or concerns such as math anxiety will compete with the ongoing cognitive task, i.e., price computation, for the limited cognitive resources, resulting in either a slowing of performance or a decline in accuracy (Ashcraft & Kirk, 2001; Eysenck & Calvo, 1992). As study 2a & 2b demonstrates, the detrimental effect of math anxiety is larger when the complexity of comparative price increases due to its spatial presentation. Math anxiety impeded computations of prices presented horizontally more than those presented vertically. This result supports the influence of cognitive resources on the differences in processing of the two spatial price presentations (Baddeley, 1992, 2001; Miyake & Shah, 1999).

Study 3a provides a nuanced understanding of the effects of constraints on computing comparative prices. Since price presentations in studies 1, 2a, and 2b did not accompany any concomitant distractions around the comparative price promotions, the presentations represented less market realism. Study 3a provided such realism while examining the effects of visual and phonological working memory on consumers' price computation. The results extended Trbovich and LeFevre (2003)'s findings in 3 ways. First, a more complex price discount format (percentage off) was adopted (Suri et al., 2013). Secondly, the proposed interaction effect between price presentation format and working memory (visual vs. phonological) was observed only for individuals with high math anxiety. Thirdly, this study used real product information (e.g., pictures and product attributes) as stimuli for creating constraints on working memory. The results show that when math anxious consumers perform price calculations, the constraints on phonological memory resources slowed their performance in horizontally presented comparative price promotions; constraints on visual memory impeded performance of vertically presented comparative price promotions. Study 3b further confirmed these findings using a non-student sample and showed the effects of such presentations on one's willingness to purchase an offer. These results provide evidence that the impediments created by visual and phonological working memory resources depends upon how the comparative price promotions are presented spatially.

We also assessed if the perceived ease of processing measured in study 3b mediated the interaction effects of price presentation and memory load on willingness to purchase. However using this overall ease in processing a promotion (vertical or horizontal) in a bootstrapping approach (Process Model 8 in Hayes, 2013) showed no significant direct or indirect effects in the two memory load conditions. It is likely that since the item measured an overall ease of processing a price promotion, it did not show mediation effects. Future studies need to use more comprehensive measures of perceived ease to examine such a possibility.

8.1. Implications

The results of these studies are managerially important. A marketer who wants consumers to notice the economic value of a comparative price promotion, a vertical price presentation will be more effective due to the low cognitive effort with which consumers compute net prices in such presentations. Furthermore, the results suggest that it matters how marketers present the attribute information in a comparative price promotion. For consumers processing under a cognitive constraint, horizontally presented comparative price promotions might be more effective when such promotions contain a rich diaspora of pictorial information. On the other hand, vertically presented comparative prices might be more effective in communicating value when such offers accompany verbal details of the product's attributes.

The empirical evidence reported here also suggests that retailers could help consumers overcome the negative effects of cognitive constraints by presenting comparative prices in a manner that relieves them from the pressure of performing computations. Hence, presenting comparative price promotions containing all possible price details (e.g., discount, discounted price information, discount in percentage-off and dollars-off) could possibly provide relief to consumers from the cognitive constraints associated with evaluating comparative price presentations. Another possibility could be to simplify the pictorial and verbal details accompanying a comparative price promotion. This would reduce the constraints on cognitive resources and improve decision making. Finally, given the observed differences in the effectiveness of price promotions used in this research, it might be a responsible marketing decision to present comparative prices vertically and more simply (both visually and verbally).

Appendix 1. Stimuli used in studies1 and 2b

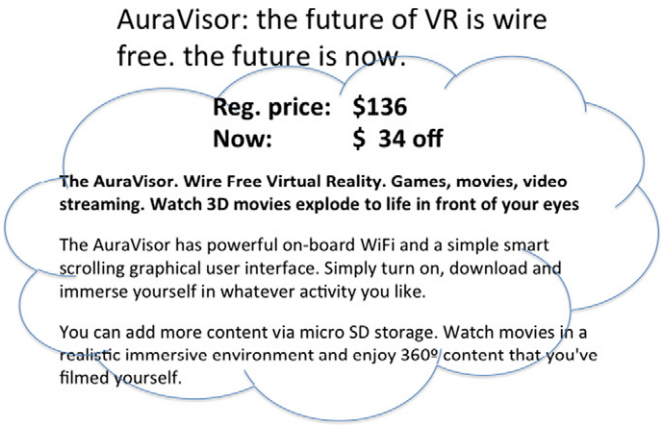
Study 1

Calculate the final price in $

Regular Price: $89
Now: $6 off

Final price is $_____

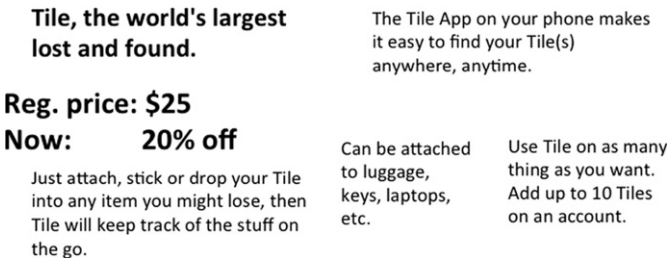
Study 2b



Appendix 2. Stimuli used in studies 3a & 3b

Visual Load

Phonological Load



References

Alba, J. W., Mela, C. F., Shimp, T. A., & Urbany, J. E. (1999). The effect of discount frequency and depth on consumer price judgments. *Journal of Consumer Research*, *26*(2), 99–114.

Alexander, L., & Martray, C. R. (1989). The development of an abbreviated version of the mathematics anxiety rating scale. *Measurement and Evaluation in Counseling and Development*.

Ashcraft, M. H., & Faust, M. W. (1994). Mathematics anxiety and mental arithmetic performance: An exploratory investigation. *Cognition & Emotion*, *8*(2), 97–125.

Ashcraft, M. H., & Kirk, E. P. (2001). The relationship among working memory, math anxiety, and performance. *Journal of Experimental Psychology: General*, *130*, 224–237.

Baddeley, A. (1992). Working memory. *Science*, *255*(5044), 556–559.

Baddeley, A. D. (2000). The episodic buffer: A new component of working memory? *Trends in Cognitive Sciences*, *4*, 417–423.

Baddeley, A. D. (2001). Is working memory still working? *American Psychologist*, *56*(11), 851.

Barone, M. J., Manning, K. C., & Miniard, P. W. (2004). Consumer response to retailers' use of partially comparative pricing. *Journal of Marketing*, *68*(3), 37–47.

Biswas, A., Bhowmick, S., Guha, A., & Grewal, D. (2013). Consumer evaluations of sale prices: Role of the subtraction principle. *Journal of Marketing*, *77*(4), 49–66.

Brysbaert, M., Fias, W., & Noël, M. -P. (1998). The Whorfian hypothesis and numerical cognition: Is 'twenty-four' processed in the same way as 'four-and-twenty'? *Cognition*, *66*, 51–77.

Carlson, R. A. (1997). *Experienced cognition.* Mahwah, NJ: Erlbaum.

Compeau, L. D., & Grewal, D. (1998). Comparative price advertising: An integrative review. *Journal of Public Policy & Marketing*, 257–273.

Coulter, K. S., & Coulter, R. A. (2005). Size does matter: The effects of magnitude representation congruency on price perceptions and purchase likelihood. *Journal of Consumer Psychology*, *15*(1), 64–76.

Coulter, K. S., & Coulter, R. A. (2007). Distortion of price discount perceptions: The right digit effect. *Journal of Consumer Research*, *34*(2), 162–173.

Dehaene, S. (1989). The psychophysics of numerical comparison: A reexamination of apparently incompatible data. *Perception & Psychophysics*, *45*(6), 557–566.

Dehaene, S. (1992). Varieties of numerical abilities. *Cognition*, *44*(1), 1–42.

Dehaene, S., Bossini, S., & Giraux, P. (1993). The mental representation of parity and number magnitude. *Journal of Experimental Psychology: General*, *122*(3), 371.

Della Bitta, A. J., Monroe, K. B., & McGinnis, J. M. (1981). Consumer perceptions of comparative price advertisements. *Journal of Marketing Research*, 416–427.

DeStefano, D., & LeFevre, J. A. (2004). The role of working memory in mental arithmetic. *European Journal of Cognitive Psychology*, *16*, 353–386.

Estelami, H. (1999). The computational effect of price endings in multi-dimensional price advertising. *Journal of Product and Brand Management*, *8*(3), 244–256.

Estelami, H. (2003). The effect of price presentation tactics on consumer evaluation effort of multi-dimensional prices. *Journal of Marketing Theory and Practice*, 1–16.

Eysenck, M. W., & Calvo, M. G. (1992). Anxiety and performance: The processing efficiency theory. *Cognition & Emotion*, *6*(6), 409–434.

Feng, S., Suri, R., & Bell, M. (2014). Does classical music relieve math anxiety? Role of tempo on price computation avoidance. *Psychology and Marketing*, *31*(7), 489–499.

Fürst, A. J., & Hitch, G. J. (2000). Separate roles for executive and phonological components of working memory in mental arithmetic. *Memory & Cognition*, *28*, 774–782.

Fuson, K. C., & Briars, D. J. (1990). Using a base-ten blocks learning/teaching approach for first-and second-grade place-value and multidigit addition and subtraction. *Journal for Research in Mathematics Education*, 180–206.

Gevers, W., Lammertyn, J., Notebaert, W., Verguts, T., & Fias, W. (2006). Automatic response activation of implicit spatial information: Evidence from the SNARC effect. *Acta Psychologica*, *122*(3), 221–233.

Goodrow, A. M. (1998). *Modes of teaching and ways of thinking. Paper presented at the International Society for the Study of Behavioral Development, Bern, Switzerland, July 1998.* ((Summary of: Children's Construction of Number Sense in Traditional Constructivist, and Mixed Classrooms. Unpublished dissertation for the degree of Doctor of Philosophy in Child Development. Medford, MA: Tufts University, May 1998). Available online at URL http://www.terc.edu/investigations/eval/html/eval-2.goodrow.html (visited 2000, May 11)).

Grewal, D., Marmorstein, H., & Sharma, A. (1996). Communicating price information through semantic cues: The moderating effects of situation and discount size. *Journal of Consumer Research*, 148–155.
Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach.* New York: The Guilford Press.
Ikeda, M., Iwanaga, M., & Seiwa, H. (1996). Test anxiety and working memory systems. *Perceptual and Motor Skills*, *82*, 1223–1231.
Imbo, I., & LeFevre, J. A. (2009). Cultural differences in complex addition: Efficient Chinese versus adaptive Belgians and Canadians. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *35*, 1465–1476.
Imbo, I., & LeFevre, J. A. (2010). The role of phonological and visual working memory in complex arithmetic for Chinese-and Canadian-educated adults. *Memory & Cognition*, *38*(2), 176–185.
Ito, Y., & Hatta, T. (2004). Spatial structure of quantitative representation of numbers: Evidence from the SNARC effect. *Memory & Cognition*, *32*(4), 662–673.
Lichtenstein, D. R., Burton, S., & Karson, E. J. (1991). The effect of semantic cues on consumer perceptions of reference price ads. *Journal of Consumer Research*, 380–391.
Miyake, A., & Shah, P. (1999). *Models of working memory: Mechanisms of active maintenance and executive control.* Cambridge: Cambridge University Press.
Morwitz, V., Greenleaf, E., & Johnson, E. J. (1998). Divide and prosper: Consumers' reaction to partitioned prices. *Journal of Marketing Research*, *35*, 453–463.
Motyka, S., Suri, R., Grewal, D., & Kohli, C. S. (2016). Disfluent vs. fluent price offers: The paradoxical role of processing disfluency. *Journal of the Academy of Marketing Science*, *44*, 627–638. http://dx.doi.org/10.1007/s11747-015-0459-0.
Puccinelli, N. M., Chandrashekaran, R., Grewal, D., & Suri, R. (2013). Are men seduced by red? The effect of red versus black prices on price perceptions. *Journal of Retailing*, *89*(2), 115–125.
Richardson, F. C., & Suinn, R. M. (1972). The mathematics anxiety rating scale: Psychometric data. *Journal of Counseling Psychology*, *19*, 551–554.
Schmidt, D., Ullrich, D., & Rossner, R. (1993). Horizontal and vertical reading: A comparative investigation of eye movements. *German Journal of Ophthalmology*, *2*(4–5), 251–255.
Schwarz, W., & Keus, I. M. (2004). Moving the eyes along the mental number line: Comparing SNARC effects with saccadic and manual responses. *Perception & Psychophysics*, *66*(4), 651–664.
Seitz, K., & Schumann-Hengsteler, R. (2000). Mental multiplication and working memory. *European Journal of Cognitive Psychology*, *12*, 552–570.
Suri, R., Monroe, K. B., & Koc, U. (2013). Math anxiety and its effects on consumers' preference for price promotion formats. *Journal of the Academy of Marketing Science*, *41*(3), 271–282.
Taylor, S. E. (1980). The interface of cognitive and social psychology. In J. Harvey (Ed.), *Cognition, social behavior, and the environment*. Hillsdale, N.J.: Erlbaum (b).
Thomas, M., & Morwitz, V. G. (2009). The ease-of-computation effect: The interplay of metacognitive experiences and naive theories in judgments of price differences. *Journal of Marketing Research*, *46*(1), 81–91.
Trbovich, P. L., & LeFevre, J. A. (2003). Phonological and visual working memory in mental addition. *Memory & Cognition*, *31*(5), 738–745.
Valenzuela, A., & Raghubir, P. (2015). Are consumers aware of top–bottom but not of left–right inferences? Implications for shelf space positions. *Journal of Experimental Psychology: Applied*, *21*(3), 224.
Vanhuele, M., Laurent, G., & Dreze, X. (2006). Consumers' immediate memory for prices. *Journal of Consumer Research*, *33*(2), 163–172.
Widaman, K. F., Geary, D. C., Cormier, P., & Little, T. D. (1989). A componential model for mental addition. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *15*, 898–919.
Yip, M. C. W. (2002). Presentation effects on arithmetic problem solving. *Psychologia*, *45*(2), 90–97.
Yu, D., Park, H., Gerold, D., & Legge, G. E. (2010). Comparing reading speed for horizontal and vertical English text. *Journal of Vision*, *10*(2), 1–17.
Heathcote, D. (1994). The role of visuo-spatial working memory in the mental addition of multi-digit addends. *Cahiers de psychologie cognitive/current psychology of cognition*.

Journal of Business Research 76 (2017) 219–236

Contents lists available at ScienceDirect

Journal of Business Research

Value-based pricing in competitive situations with the help of multi-product price response maps

Florian Dost [a,*], Ingmar Geiger [b,c]

[a] European University Viadrina, Große Scharrnstraße 59, D-15230 Frankfurt (Oder), Germany
[b] Freie Universität Berlin, Marketing-Department, Arnimallee 11, D-14195 Berlin, Germany
[c] Aalen University, School of Business, Beethovenstr. 1, D-73430 Aalen, Germany

ARTICLE INFO

Article history:
Received 30 September 2015
Received in revised form 12 February 2016
Accepted 13 July 2016
Available online 11 January 2017

Keywords:
Value-based pricing
Competitive pricing
Price response map
Consumer indecisiveness map
Willingness to pay as a range

ABSTRACT

This article introduces multi-product price response maps for various value pricing applications in competitive situations. The maps are based on the direct elicitation of individual willingness to pay (WTP) as a range for competing products; they reveal an individual's or market's choice probability for a focal product, at its own and competing products' prices. Transforming the price response into profit, revenue, or unit sold maps supports optimal pricing decisions. The maps are also useful for optimizing profit differences from the closest competitor and for portfolio pricing. Managers can use a consumer indecisiveness map, gained from the WTP range data, to devise complementary marketing measures at prices where consumer uncertainty is high. The illustration of this approach uses two empirical examples, featuring two or more competing consumer goods, and demonstrates the predictive and external validity of these proposed maps.

1. Introduction

Managers' knowledge of consumers' willingness to pay (WTP) – or reservation price – is the cornerstone of pricing strategy (Anderson, Jain, & Chintagunta, 1993; Homburg, Koschate, & Hoyer, 2005). Knowledge of individual WTP levels allows one-to-one pricing (Shaffer & Zhang, 1995). Aggregate WTP levels – such as in a price response curve – permit managers to optimize market prices according to microeconomic theory (e.g., Homburg, Kuester, & Krohmer, 2009; Varian, 1992). Such pricing approaches are referred to as value pricing, because they optimize a manager's goal metric (usually profit) by pricing with respect to consumers' perceptions of the (relative) value of the product or service.

Value pricing is the most desirable pricing approach (Liozu, Hinterhuber, Perelli, & Boland, 2012), but because they often lack up-to-date WTP information – especially joint WTP for their own and competitors' products – or the skills to exploit that information, few managers actually engage in value pricing (Liozu et al., 2012; Rao & Kartono, 2009). Intriguingly, managers are even less likely do so when they focus more on competitors' prices (Rao & Kartono, 2009). Yet if managers knew and considered consumers' WTP for their own and competitors' products, they could determine how many consumers would purchase which product, for each combination of their own and competitors' prices (Jedidi & Zhang, 2002). Despite a rich body of marketing research on WTP, a key direction for continued research remains the effort to get "to know the joint distribution of consumers' reservation prices (WTP) for its products and those of its competitors" (Jedidi & Jagpal, 2009, p. 58).

This article builds on advances in the conceptualization and measurement of WTP as a range (Wang, Venkatesh, & Chatterjee, 2007) and proposes eliciting empirical WTP range distributions for several products at the same time. Such an approach facilitates optimal price setting for multiple products and different pricing goals in nonlinear, uncertainty-rich, real-life settings. It also supports data elicitation at minimal cost and helps integrate pricing strategy with other marketing activities. The proposed approach consists of four steps: First, it elicits consumers' WTP for multiple, competing products, employing direct, individual WTP measures (Wertenbroch & Skiera, 2002). This study uses WTP ranges instead of traditional point-based WTP measurements, because they incorporate more information in the shape of consumer uncertainty about preferences and product performance (Schlereth, Eckert, & Skiera, 2012; Wang et al., 2007). Using WTP ranges also allows for comparatively smaller sample sizes, as demonstrated subsequently.

Second, the individual WTP range values for competing products support the construction of so-called price response maps, which represent empirical, multi-product distributions of consumers' price responses. They indicate consumers' aggregated choice probabilities for one product at a certain price, given the prices for competing products.

Third, by integrating the volume sold and cost information for the focal products, the authors construct maps of the units sold, revenue,

* Corresponding author.
E-mail addresses: dost@europa-uni.de (F. Dost), ingmar.geiger@fu-berlin.de, Ingmar.geiger@hs-aalen.de (I. Geiger).

http://dx.doi.org/10.1016/j.jbusres.2017.01.004
0148-2963/

and profits, which can help managers set optimal prices, depending on their goal. These revenue and profit maps can enable product price optimization in initial price setting environments or define reactions to competitors' price changes (manufacturer view), as well as lead to product portfolio price optimization (retailer view). By considering both manufacturer and retailer views, this methodology also helps uncover potential conflicts of interest in the value chain.

Fourth, the information in WTP ranges can be used to optimize not only the pricing decision but also the accompanying marketing measures (Dost, Wilken, Eisenbeiss, & Skiera, 2014; Wathieu & Bertini, 2007). At the aggregate level, WTP range information may indicate market responsiveness to other marketing activities at current or target price levels (Schlereth et al., 2012). The aggregated consumer floor and ceiling prices (i.e., end points of individual WTP ranges) produce an indecisiveness map, which can help managers decide at what level of their own and competitors' prices their additional, supportive marketing measures are especially effective. Combining optimal pricing maps with maps for consumer indecisiveness helps managers trade off competing price and non-price marketing activities and consider truly integrated marketing campaigns.

The rest of this article is structured as follows: Section 2.1 presents the method to elicit WTP as a range in a competitive environment, followed by the methodological basis for computing price response maps, as well as profit, revenue, and indecisiveness maps. Sections 2.3 and 2.4 detail managerial applications of the different maps. The illustration of the approach to value-based pricing in competition with an empirical example in Section 3 features two consumer products. After describing the empirical study, Section 3.1 establishes support for the approach's predictive and external validity and the method's robustness, even with small sample sizes, through a simulation study. Section 3.2 demonstrates its applicability to a range of value-based pricing questions, such as initial price setting, reactions to competitor price changes, or portfolio price optimization. Section 4 provides a second empirical application, featuring more than two competing products. The approach and examples, as well as the contributions to research and practice, are the focus in Section 5.

2. Theoretical considerations

2.1. Direct multi-product WTP as a range measurement

The foundation of this proposed approach is the measurement of individual WTP as a range (Dost & Wilken, 2012; Wang et al., 2007) for a set of competing products. This method obtains, from each respondent, a floor and ceiling reservation price, which reflect the limits of her or his WTP range, for all competing products, after that respondent has been exposed to all focal products. Thus, the reservation prices of different products are not assumed to be independent. These data are needed to compute the subsequent multi-product price response maps; however, several different WTP range elicitation methods could be used.

Direct WTP range elicitation is very easy to implement and can be applied to all types of product categories. Nor does it require any prior data history, so this approach can apply to new product introductions. It can predict consumer price responses across all possible prices, instead of a limited set (Wertenbroch & Skiera, 2002), whereas choice-based methods focus on a limited set of prices, commonly assume linearity in individual preferences, and cannot account for real-life, non-linearly related WTP distributions across competing products (Jedidi & Jagpal, 2009). The relatively few data points for estimating utility functions in choice-based approaches also may lead to inaccuracies in WTP estimates (Wilken & Sichtmann, 2007). Although direct WTP measurement frequently leads to overstatements and hypothetical bias (Voelckner, 2006), hypothetical and incentive-aligned direct WTP measurement both fare better in eliciting truly price-optimizing WTP distributions than their respective choice-based counterparts (Miller, Hofstetter, Krohmer, & Zhang, 2011). When increased bias reduction is necessary, direct WTP range measurement can draw on incentive-aligned approaches (Dost & Wilken, 2012; Wang et al., 2007), assuming their application is practically feasible in the respective product category.

The proposed procedure uses the WTP as a range measurement, which captures consumer uncertainty as point-based WTP does not and also elicits more information from consumers than do point-based WTP measurements. Wang et al. (2007) argue that consumers suffer from uncertainty and therefore construct their WTP as a range of reservation prices, each with a corresponding choice probability. This range of reservation prices subsumes diverse definitions of reservation price like the floor reservation prices, "at or below which a consumer will demand one unit of the good" (Varian, 1992, p. 152), which indicates 100% choice probability; "the price at which a consumer is indifferent between buying and not buying" (Moorthy, Ratchford, & Talukdar, 1997, p. 265), or 50% choice probability; and the ceiling reservation price, "the minimum price at which a consumer would no longer purchase" (Hauser & Urban, 1986, p. 449), which indicates 0% choice probability. A WTP range also can be understood as a measure of variance (or scale parameters) in the individual distribution of choice probability around a true, yet latent, individual WTP (Dost & Wilken, 2012; Schlereth et al., 2012). For example, a consumer might be sure to buy a product up to a price of $4 (floor reservation price) and equally sure not to buy the product at prices higher than $8 (ceiling reservation price). For any price between $4 and $8 (the consumer's WTP range), she is indecisive about whether to purchase. The width of the WTP range indicates her uncertainty about preferences and product performance; her average reservation price is a measure of her latent true WTP, somewhere within that WTP range (Maier, Wilken, & Dost, 2015). Fig. 1 illustrates this WTP range example.

For value pricing—the main goal of the proposed procedure—capturing uncertainty is useful, because when consumer uncertainty in a market is higher, WTP range measurement better predicts consumer choice, compared with point-based WTP (Dost & Wilken, 2012). More consumer uncertainty in a market increases the bias in optimal pricing decisions based on point-based WTP measurements, for both optimal one-to-one pricing and optimal market pricing (Dost & Wilken, 2012). The price response map resulting from WTP range measurements thus is likely less biased, and such measurements are particularly useful in markets with uncertainty, such as those for experience or credence goods (Zeithaml, 1988).

The rich information contained in the WTP ranges is also managerially useful. A challenge for direct point-based WTP measurement is the need for large samples, whereas WTP ranges already capture information about market-level consumer heterogeneity, because consumers observe other market participants' behavior and adjust their preferences accordingly (Park, MacLachlan, & Love, 2011). This richer information per measured consumer should reduce the sample size needed for predictions of market choice. Alternatively, with comparable sample sizes, measuring WTP ranges may result in smoother price response curves or maps, with fewer of the jagged lines that are common in traditional price response curves obtained with point-based WTP measurements and that often distort optimal price estimation with their partial non-differentiability. This research empirically demonstrates that with WTP range measurements, even sample sizes as low as 40 respondents can produce valid multi-product price response maps.

2.2. Computing multi-product price response and consumer indecisiveness maps

The first step for building a price response map is to transform WTP range estimates into a continuous function of product choice probability for each individual consumer and each product. Consistent with extant approaches (Dost & Wilken, 2012; Schlereth et al., 2012), this study relies on a logistic choice probability function with values from 1 to 0,

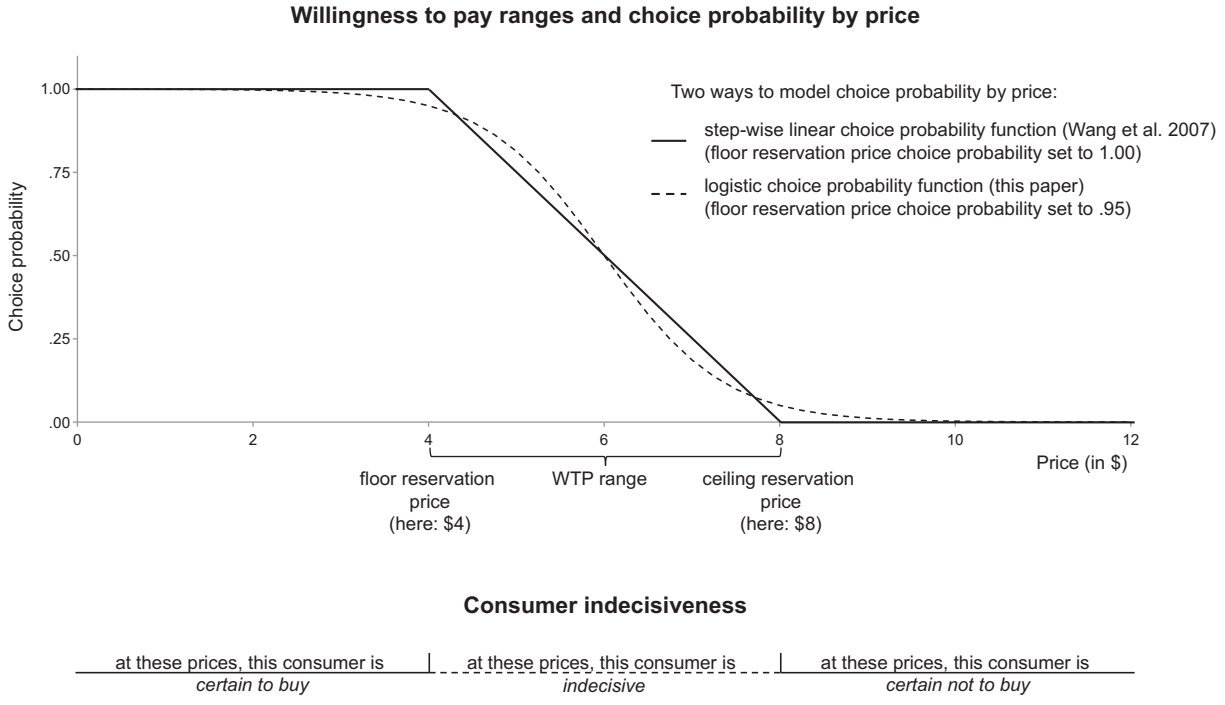


Fig. 1. WTP range concept.

based on measured floor and ceiling reservation prices.[1] The choice probability for the floor reservation price is set to 0.95; that for the ceiling reservation price to 0.05 (see Dost & Wilken, 2012). The inflection point is set to the average between the floor and ceiling reservation prices. The resulting formula is:

$$Pr_{n,i}(p_i, fp_{n,i}, cp_{n,i}) = \frac{1}{1 + e^{\left(\frac{\ln\left(\frac{0.05}{0.95}\right)}{\frac{fp_{n,i} - cp_{n,i}}{2}} \times \left(p_i - \frac{fp_{n,i} + cp_{n,i}}{2}\right)\right)}},$$

where $Pr_{n,i}$ denotes the choice probability for consumer n and product i, p_i is the price of product i, $fp_{n,i}$ refers to the floor reservation price of consumer n for product i, and $cp_{n,i}$ reflects the respective ceiling reservation price. With the choice probabilities for all products j, an individual price response map can be calculated for each consumer n and product i:

$$PriceResponse_{n,i}\left(p_i, p_j\right) = \begin{cases} Pr_{n,i}(p_i, fp_{n,i}, cp_{n,i}) & ; Pr_{n,i}(p_i, fp_{n,i}, cp_{n,i}) \geq Pr_{n,j}\left(p_j, fp_{n,j}, cp_{n,j}\right) \\ 0 & ; Pr_{n,i}(p_i, fp_{n,i}, cp_{n,i}) < Pr_{n,j}\left(p_j, fp_{n,j}, cp_{n,j}\right) \end{cases}$$

Consequently, consumer n's probability of choosing product i depends on her choice probability for product i and its price p_i, as well as on the choice probabilities for all other relevant products j (*not* i) at their respective prices p_j.

These price response maps then can be aggregated for each product and over all respondents to obtain market-level price response maps. Numerically, it requires calculating average consumer price responses over a grid of price combinations, as the subsequent empirical examples reveal. A much simpler indecisiveness map also can be computed as:

$$Indecisiveness_n\left(p_i, p_j\right) = \begin{cases} 1 & ; p_i \in [fp_{n,i}; cp_{n,i}] \vee p_j \in \left[fp_{n,j}; cp_{n,j}\right] \\ 0 & ; p_i \notin [fp_{n,i}; cp_{n,i}] \wedge p_j \notin \left[fp_{n,j}; cp_{n,j}\right] \end{cases},$$

where consumer n is indecisive if any of the prices for products i or j falls within her individual WTP range. Aggregating these indecisiveness maps yields a map of market indecisiveness, reflecting consumer responsiveness to additional marketing activities. The R syntax for computing these multi-product price response maps and consumer indecisiveness maps is in Appendix A.

2.3. Value pricing using multi-product price response maps and their derivatives

The multi-product price response maps form a valuable basis for many managerial pricing tasks. The various applications can be differentiated on four dimensions: (a) the type of pricing goal, such as profit, revenue, or unit sales; (b) self versus competitor focus; (c) individualistic versus competitive goals; and (d) single- versus multiple-product (i.e., portfolio) focus. Each pricing task may consist of any combination of these dimensions, for which the multi-product price response maps can be applied.

Regarding the pricing goal, initial multi-product price response maps that describe the average choice probabilities per consumer can easily be transformed into market-level maps of the units sold, revenue, or profit. For the first two measures, only the total size of the market is needed as supplementary information; the latter requires a cost function for the focal product(s). The transformation of a multi-product price response map into a market-level units sold map requires multiplying the average choice probabilities for every price combination by the total market size. To construct a market-level revenue map, those values also must be multiplied by the focal product prices. Finally, employing margins, or prices minus costs (from a cost function), leads to a market-level profit map. For example, a profit map for the focal product reveals the profit topology depending on its own and

[1] The question of how an actual choice probability function behaves within a consumer's WTP range is both uncertain and hard to determine empirically. The proposed logistic function reflects the density function of an underlying bell-shaped distribution of reservation prices around a latent mean WTP (Dost & Wilken, 2012). Alternatively, a step-wise linear choice probability function would reflect a uniform distribution of reservation prices around a latent mean WTP (Wang et al., 2007). From a practical perspective, the logistic function proposed herein makes the computation easier (computation time) and maps smoother, because the equations are continuous and differentiable. Smoother maps allow for more fine-grained managerial implications in terms of price setting, compared with the plateaus that step-wise WTP range functions would produce in the maps.

Table 1
Descriptive statistics.

	Mean (in $)	SD	Correlation coefficients			
			FP_{tide}	CP_{tide}	FP_{purex}	CP_{purex}
Tide floor reservation price (FP_{tide})	8.11	5.14	1			
Tide ceiling reservation price (CP_{tide})	12.16	7.77	0.740	1		
Purex floor reservation price (FP_{purex})	5.40	4.55	0.756	0.582	1	
Purex ceiling reservation price (CP_{purex})	9.32	6.57	0.600	0.789	0.773	1

Notes: All correlation coefficients are significant at $p < 0.01$.

competitors' product prices. Any deviation between the focal product's actual and its profit-maximizing price would suggest the need for price adaptations.

A pricing manager can implement such an exercise from the perspective of the firm's own company or product. However, the same procedure also can support an analysis of competitors' situations. For revenues and units sold, no supplementary information is needed, whereas for a competitor's product profit map, a cost function must be estimated. This type of analysis predicts a competitor's likely actions or responses to the focal firm's own pricing actions, which in turn suggests scenarios that can serve as bases for price reaction planning.

The maps also facilitate the pursuit of different goals from a competitive strategy perspective (Porter, 1985). One competitive situation might encourage the maximization of one's own profits, disregarding competitors. In other, more competitive situations, outperforming competitors may take higher priority and call for a profit difference map, which can be created by subtracting the main competitor's product profit from the focal product's profit across all price combinations. This profit difference map then exhibits the price points at which the focal product outperforms (or underperforms) its main competitor.

Finally, adding the profit, revenue, or units sold maps for two or more competing products establishes a portfolio optimization perspective. Such a perspective is often pertinent to retailers, as well as manufacturers that offer competing products within a single category. With this step, these businesses can optimize their joint profits, revenues, or units sold.

2.4. Devising integrated marketing campaigns using indecisiveness maps

The additional information captured in WTP ranges (cf. WTP point estimates) can be used to devise integrated marketing activities targeted at indecisive consumers (Dost et al., 2014). If a product price falls within a consumer's WTP range, this consumer is indecisive about the purchase decision and likely to react to marketing stimuli by making up her mind. That is, indecisive buyers are more responsive than definite (non-)buyers to additional cues such as a fair trade label (Wathieu & Bertini, 2007), guarantees, positive consumer reviews, advertising, and price promotions (Dost et al., 2014). Respondents processing such cues adjust their actual choices as if the price were above or below their WTP range (Wathieu & Bertini, 2007). Aggregating multi-product indecisiveness, instead of price responses, creates a map that marks varying levels of consumer responsiveness to additional cues for all combinations of relevant prices.

Managers using these indecisiveness maps then can determine a price point for their own product (given competitor prices) at which a maximum of consumers are undecided and could be won through additional marketing stimuli. Such a move would be equivalent with the goal of increasing the focal product's market share. Combining such indecisiveness maps, which show consumer responsiveness, with optimal pricing maps enables managers to trade off competing activities or combine mutually supportive price and non-price marketing activities, as well as anticipate the results of divergent goals (e.g., market share vs. profit).

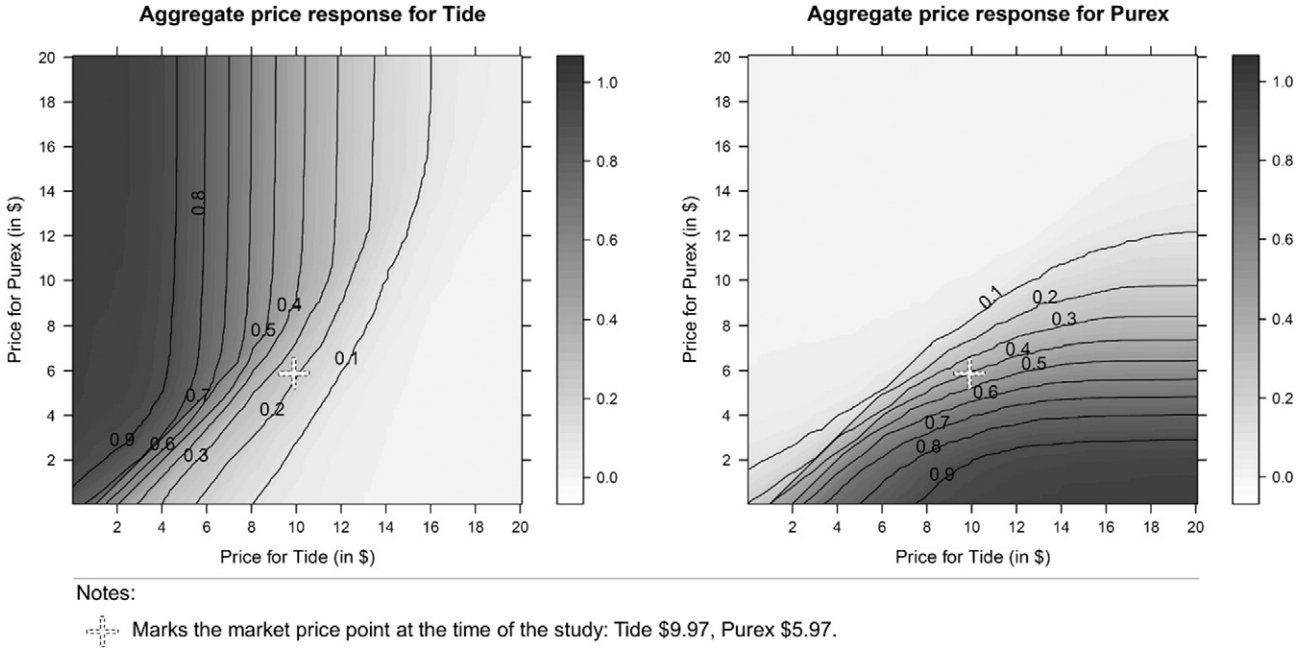


Fig. 2. Aggregate price response maps for Tide and Purex.

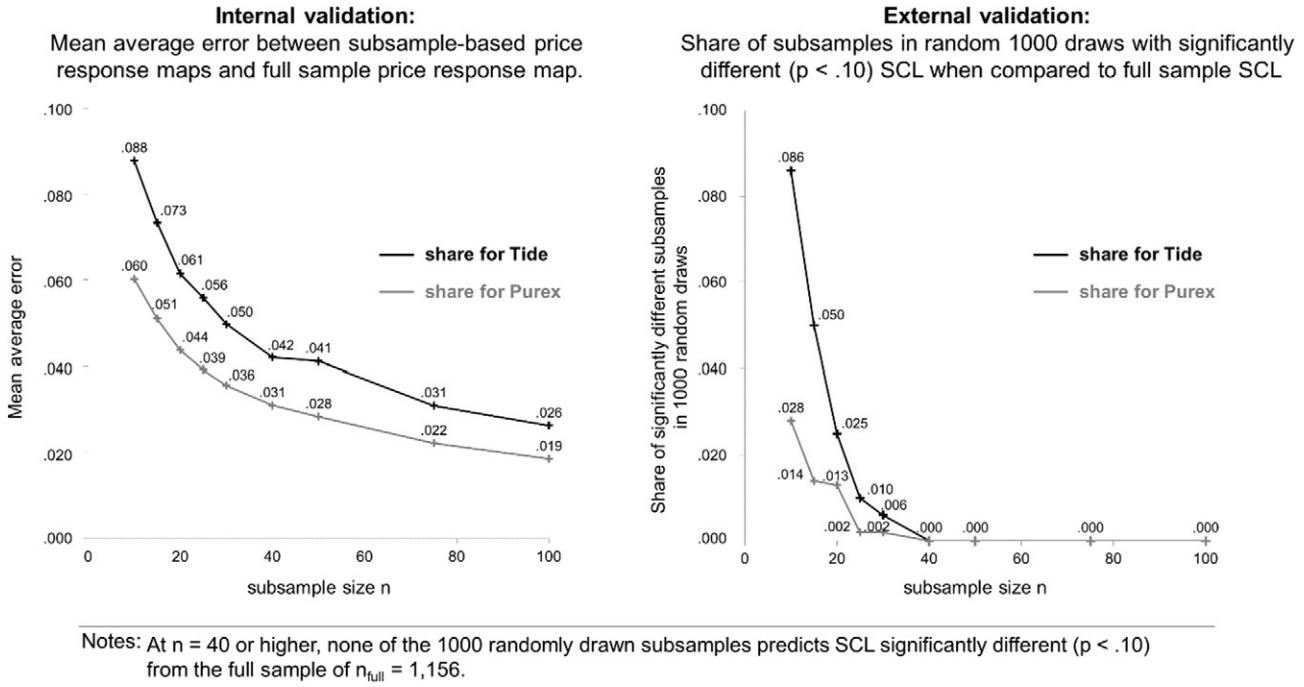


Fig. 3. Robustness of price response maps to small sample sizes.

3. Empirical study 1: a two-product example

The first empirical study tests the predictive validity of the proposed empirical multi-product price response maps and demonstrates applications for value pricing. To offer a clear graphic representation of the resulting maps, this study is limited to two products.

3.1. Study setup

3.1.1. Design

The simulated online store offers for this study featured a picture, complemented with a semantic description, of a medium-priced and a high-priced liquid detergent, both developed for use with energy-

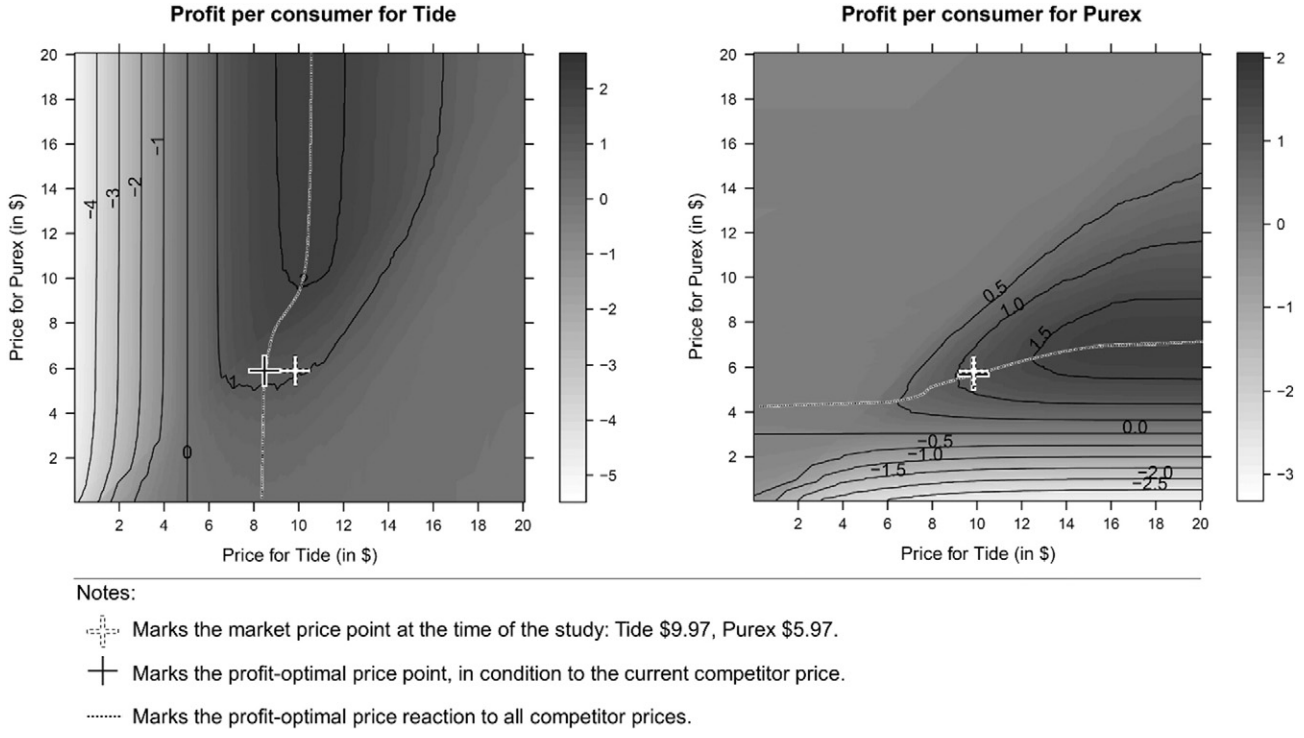


Fig. 4. Profit maps for Tide at $5 cost and Purex at $3 cost.

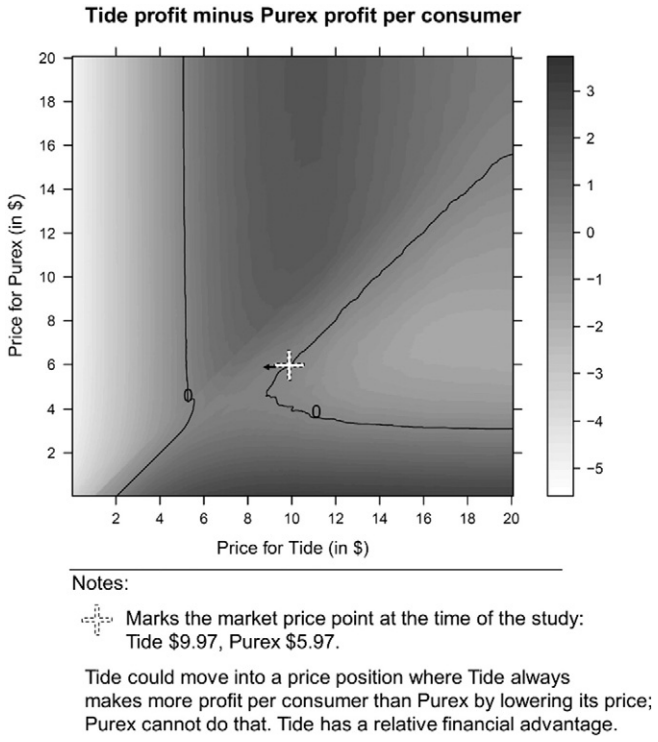


Fig. 5. Tide's pricing power for higher profits over Purex.

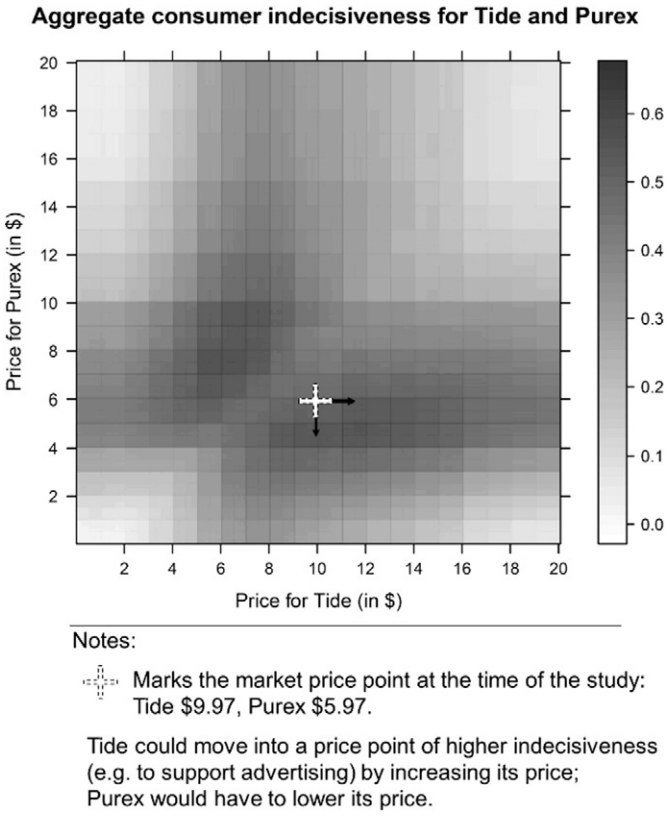


Fig. 7. Aggregated consumer indecisiveness map.

saving washing at low temperatures. Specifically, the stimuli indicated a 100 fl. oz. bottle of Ultra Purex Coldwater liquid detergent and a competing, higher priced 100 fl. oz. Tide Coldwater bottle. For this fast moving consumer good, a considerable portion of consumers should be uncertain, because such detergents only recently had been introduced to the market. At the time of the study, the online price for Ultra Purex Coldwater at Walmart was $5.97, and the price for Tide Coldwater was $9.97.

The main dependent variables were the floor and ceiling reservation prices for both products. These reservation prices were elicited in an open-ended direct format ("Please state the maximum price up to which you would definitely buy this bottle of BRAND" and "Please state the price beyond which you would definitely no longer buy this bottle of BRAND"); the brand order was random. An additional choice task also provided information for a later assessment of internal predictive validity. In the task, a respective price for each product was drawn randomly from a uniform distribution in the interval [$2; $12].The

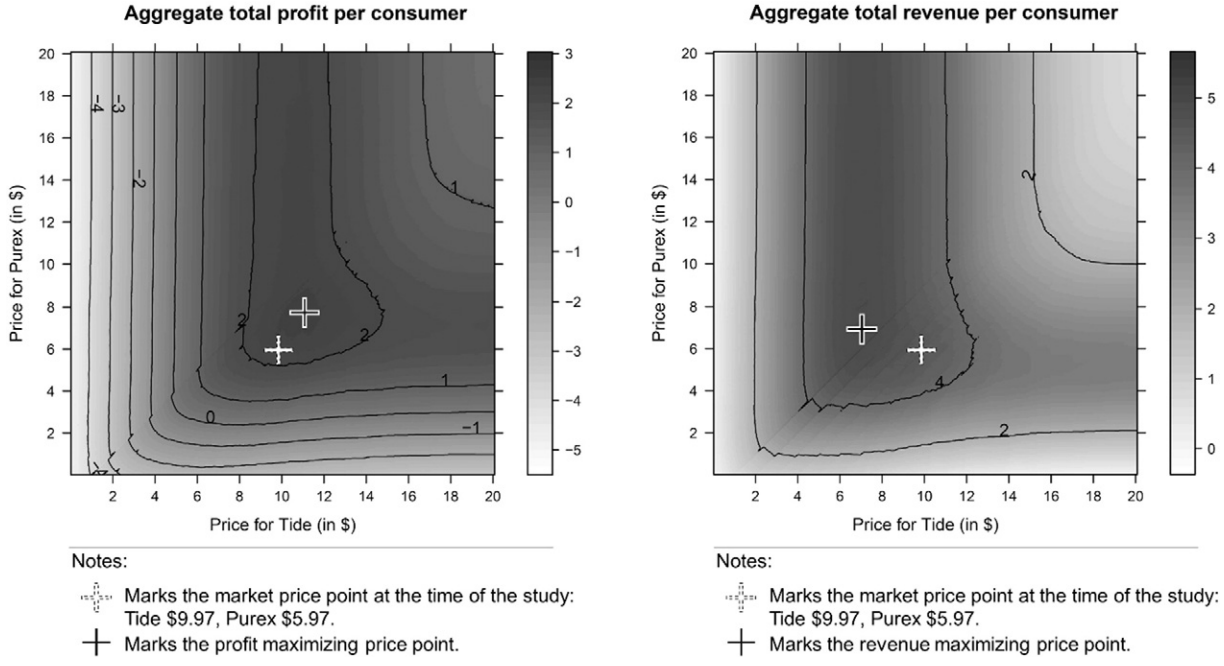


Fig. 6. Product portfolio optimal pricing map.

Table 2
Descriptive statistics for study 2.

	M (in $)	SD	Correlation coefficients					
			FP_{adv}	CP_{adv}	FP_{bay}	CP_{bay}	FP_{tyl}	CP_{tyl}
Advil floor reservation price (FP_{adv})	6.00	3.63	1					
Advil ceiling reservation price (CP_{adv})	10.47	8.26	0.619	1				
Bayer floor reservation price (FP_{bay})	5.53	3.38	0.857	0.459	1			
Bayer ceiling reservation price (CP_{bay})	9.69	6.14	0.657	0.894	0.669	1		
Tylenol floor reservation price (FP_{tyl})	5.83	3.43	0.886	0.602	0.868	0.686	1	
Tylenol ceiling reservation price (CP_{tyl})	10.18	7.24	0.623	0.954	0.523	0.911	0.693	1

Notes: All correlation coefficients are significant at $p < 0.01$.

response options for the choice variable were none, Tide, or Ultra Purex. Each respondent had to complete this task once. A control group, used for external predictive validity, saw just the choice task without any prior WTP range elicitation. The data collection also asked for demographic information, the respondents' best guess of a common price for liquid detergent in stores, and the deal attractiveness for both brands, measured on seven-point Likert scales. These measures provided reliability checks for the choice-at-randomized-prices task.

3.1.2. Respondents and procedure

The 1903 (1568 for the main study + 335 for the validation sample) respondents were recruited through Amazon Mechanical Turk (MTurk), a crowdsourcing platform for human tasks. In line with Mason and Suri's (2012) guidelines for research on this platform, to ensure reliable, valid results, the pool of potential respondents was restricted to U.S. residents. Each respondent received a reward between $0.30 and $0.82, depending on the length of the questionnaire (main vs. validation sample), the respondent's attention (see below), and the demand situation in MTurk. The study design required respondents to open a link to the survey, hosted on another survey platform, and then transfer a unique code back onto MTurk. The average survey duration was approximately 6 min. To increase attention and time to think, the "continue" button was disabled for several seconds, equivalent to a reading speed of 250 words per minute (Kapelner & Chandler, 2010). The minimum time to complete the survey thus was 3:20 min. If any participants indicated that their best guess for a common liquid detergent price in a store was either below $0 or more than $100, they were excluded. Three further fail-check items helped ensure attentive reading by the respondents. The first asked the respondents to check the third box from the left, the second item asked them to state the number 0.12 to receive a $0.12 bonus, and the third asked whether the study was about cars. These checks eliminated 450 respondents (23.6%), leaving 1156 cases for the main analysis and 297 cases for the validation sample. According to the participants' self-reports, 57.5% were women, and their mean age was 33.0 years (SD = 11.69). In addition, 68% of participants reported having a college degree, and their median monthly income was $2000. This sample is not representative of the relevant U.S. market for liquid detergents, but the data still can provide evidence of the predictive and external validity of the approach, as well as the procedure for several pricing applications. For actual pricing applications, the sample would need to be representative of the relevant market.

3.1.3. Price response maps and validity checks

Table 1 shows the mean floor and ceiling reservation prices for both products, as well as their correlations. The correlations already exhibit non-independent WTP distributions, which is an argument in support of the direct measurement of both products' WTP.

Fig. 2 depicts the aggregated price response maps, numerically calculated for prices from $0 to $20 in $0.05 steps. All calculations were run in the R statistical computing environment; the graphs were built using the latticeExtra package.

The lines in the maps represent iso-probability lines: for example, at a price of $10 for Tide and $6 for Purex, the price response for Tide is close to the 0.2 probability line (left-side map in Fig. 2), and for Purex, it is close to the 0.4 probability line (right-side map in Fig. 2). An estimated 20% of consumers thus would choose Tide and around 40% would choose Purex at this price point. Comparing the two price response maps reveals that this sample of consumers currently favors Purex branded detergent. Purex quickly loses demand as Tide becomes cheaper, but consumers' choice of Tide gradually picks up at prices lower than $10, no matter the price for Purex.

The next step is to assess the predictive validity of the price response maps at the individual level. Similar to extant studies using WTP as a range, the current study adopted a shift-in-choice likelihood (SCL) criterion to assess the predictive validity of the predicted price response

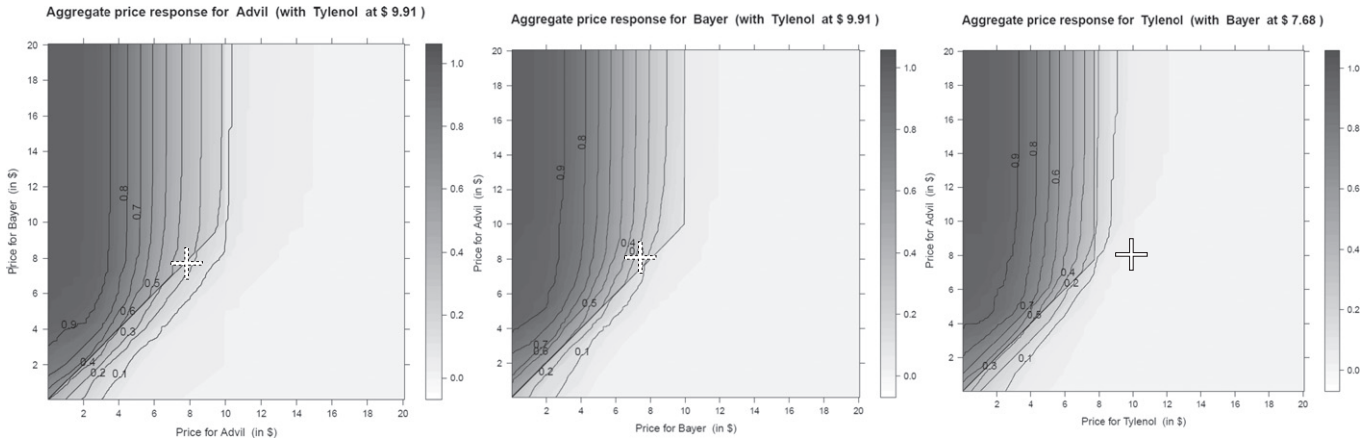


Fig. 8. Aggregate price response maps for Advil, Bayer, and Tylenol at the missing brand's current price.

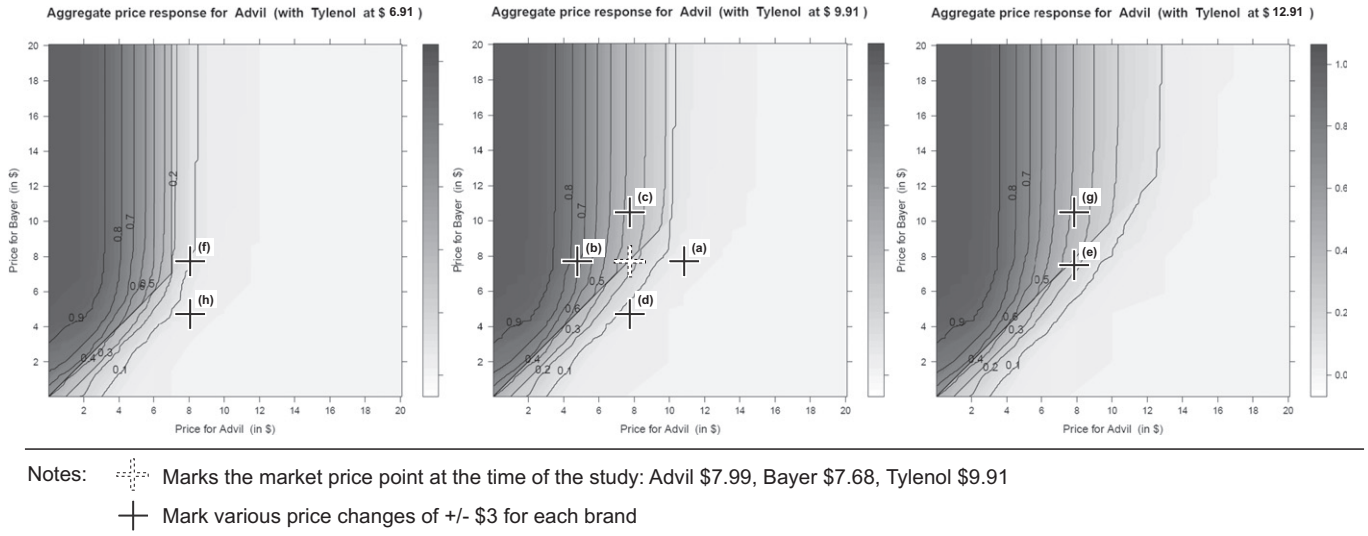


Fig. 9. Aggregate price response map for Advil against Bayer at three different Tylenol prices.

(Dost & Wilken, 2012; Wang et al., 2007). The application of SCL reflected an absolute difference between the actual choice in the choice task and the calculated choice probability—similar to the commonly used mean absolute error (MAE). For example, if a respondent chose Tide at a price of $8, the actual choice probability is 1, but if her calculated choice probability was only 0.2 at $8, the SCL would be 0.8. The mean SCL values should be generally low to indicate predictive validity and significantly lower than a 50% chance. A subsequent test of the empirical mean SCL values for each brand's choice probability relied on a one-sample, two-sided *t*-test relative to the chance threshold of SCL = 0.5. The mean SCL results are SCLtide = 0.21 (SD = 0.37; significantly lower than 0.5 with $t = 26.6$, $p < 0.001$) and SCLpurex = 0.20 (SD = 0.37; significantly lower than 0.5 with $t = 27.5$, $p < 0.001$). Both mean SCL values thus indicate the good predictive validity of the individual price response maps, comparable in size to those for a single product in previous studies (e.g., absolute SCL values in Dost and Wilken (2012) ranged between 0.03 and 0.25).

To demonstrate external validity, a cross-sample validation compared choice from the validation sample with predictions from the initial sample. The comparison included each individual respondent's choice from the validation sample with the respective aggregated price response map prediction—computed from the initial sample—at the two random prices for Tide and Purex, which served the choice task in the validation survey. The SCL criterion again served as a validity check. However, the SCL values instead are computed as the absolute difference between a validation sample respondent's choice (1 or 0) and the predicted aggregate choice probabilities from the price response maps (based on the initial sample). Similar to within-respondent SCL, this measure is conservative, because for aggregate choice probabilities close to 0.5, the best SCL can only be slightly lower than 0.5. Consequently, another test considers if mean SCL is significantly lower than 0.5, using a one-sample *t*-test. These external validity mean SCL results are as follows: SCLtide = 0.39 (SD = 0.24; significantly lower than 0.5 with $t = 8.1$, $p < 0.001$) and SCLpurex = 0.31 (SD = 0.32; significantly lower than 0.5 with $t = 10.2$, $p < 0.001$). These results confirm the price response maps' valid predictions of product choice in an independent sample.

3.1.4. Robustness to smaller sample sizes

A managerially relevant methodological goal is not just a valid measure of price response maps but valid measurements with minimal cost and effort. The WTP ranges provide rich information about each individual respondent and therefore should support the construction of aggregated price response maps with relatively small samples. Therefore, a good check of the robustness of the price response maps can be achieved by decreasing the sample size.

A numerical simulation drew 1000 random subsamples of varying subsample sizes from the 1156-respondent sample, calculated the price response maps, and evaluated their validity in two ways. The subsample sizes tested are $n_{sub} = \{10; 15; 20; 25; 30; 40; 50; 75; 100\}$. The measure for internal validity calculated MAE between the subsample price response maps and the original, full-sample price response maps at all price combinations for p_{tide} and p_{purex}, with both prices ranging from $2 to $12 (similar to the range of random prices in the choice task of the validation sample) in $0.05 steps. The measure of external validity calculated SCL for predictions from the subsample-based price response maps on individual choices in the validation sample. The comparison of these SCL values with the SCL values of the original full-sample predictions relies on a *t*-test. In counting the percentage of random subsamples that produced significantly higher SCL ($p < 0.1$), subsamples of a specific sample size were considered comparably valid to the full sample if none of the 1000 random draws showed any significantly different SCL. Therefore, a significance threshold of $p < 0.1$ is a more conservative yardstick for these purposes than the commonly used $p < 0.05$ or $p < 0.01$. Robustness results for all subsample sizes are in Fig. 3.

With sample sizes of 40 respondents or more, the random subsamples no longer show any significantly different predictions for choice in the validation sample compared with the full sample (right-side graph, Fig. 3). The corresponding MAE values are 0.04 for the Tide price response map and 0.03 for the Purex price response map. These price responses lie within the interval [0;1], so the MAE values can be interpreted as the average deviation in choice probability percentage points. For example, the Tide market choice probability of a price

Table 3
Predicted Advil market share after price changes.

Scenario	Description	Predicted Advil market share (units sold)
	Current price level (Advil at $7.97)	22.03%
(a)	Advil increases price by $3	3.60%
(b)	Advil decreases price by $3	69.70%
(c)	Bayer increases price by $3	35.20%
(d)	Bayer decreases price by $3	6.40%
(e)	Tylenol increases price by $3	22.98%
(f)	Tylenol decreases price by $3	9.70%
(g)	Bayer and Tylenol increase price by $3	36.50%
(h)	Bayer and Tylenol decrease price by $3	4.50%

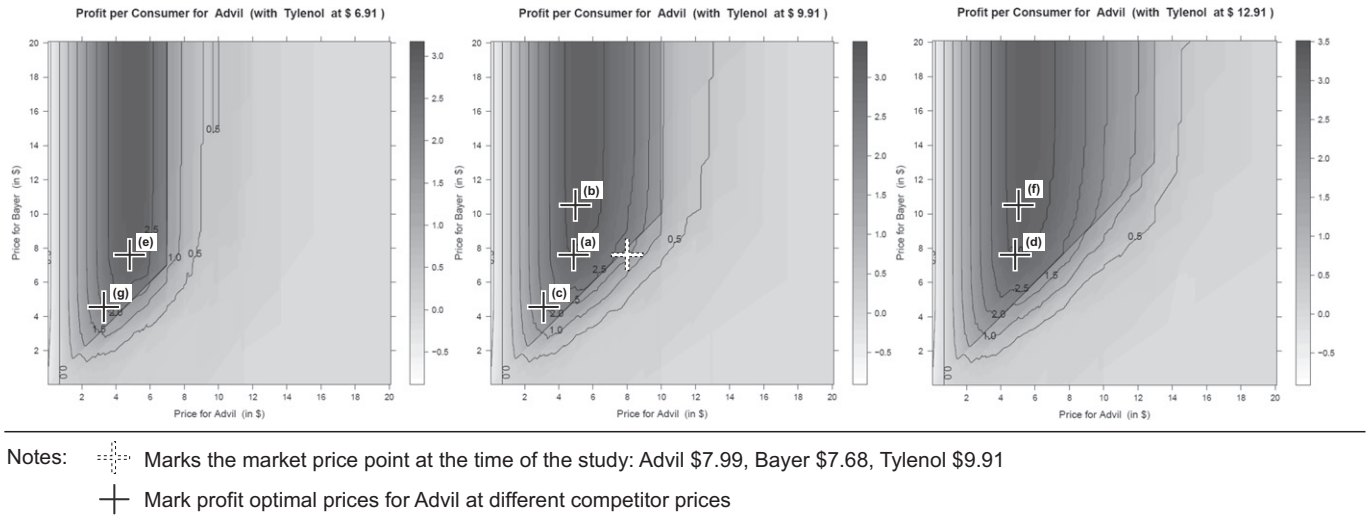


Fig. 10. Advil profit maps at three different Tylenol prices.

response map calculated from a subsample of just 40 respondents deviates on average by just 4.2 percentage points from the respective full-sample price response map.

In conclusion, the WTP range-based price response maps can be calculated from samples as small as 40 respondents without producing severely different results than a full sample map calculated from 1156 respondents. This result should facilitate the easy, affordable implementation of this procedure in a managerial context, as long as the smaller samples sufficiently represent the relevant market.

3.2. Competitive and product portfolio optimizing pricing strategies

Having calculated and validated the aggregate price response maps, it is possible to establish their application for value pricing and determine the optimal price levels, given competition, as well as the best reactions to competitors' price changes. Applications also are available for product portfolio pricing and supportive combinations with non-pricing marketing activities.

To transform the price response maps into maps that show profits, it is necessary to multiply both price response map matrices with a vector of margins. This margin vector is simply the current price minus cost per product sold (this demonstration uses only the variable cost per product). The operation is equivalent to transforming a single-product price response function into a profit function—but in this case, done simultaneously for two products at different prices. According to industry experts, the cost for a sold unit of detergent is $4 plus/minus $1–$2. In this example demonstration, the estimated cost per product sold is set to $5 for Tide and $3 for Purex. Fig. 4 shows the two profit maps, numerically calculated for prices from $0 to $20 in $0.05 steps. It also shows a path of profit-maximizing price reactions to the price level of each respective competitor.

In these profit maps, the black lines represent iso-profit lines, indicating identical profits along them. For a manager responsible for the focal brand, this map indicates whether the brand's current price, given the competitor's price, is optimal in terms of profit or not. If not, the map shows in which direction the focal product's price should change. As Fig. 4 indicates, Purex currently prices almost according to the profit optimum identified by this profit map. In contrast, Tide could increase its profit by slightly lowering its price. It would not change much though, and the profit maps reveal why: Purex's optimal reaction follows a rather pronounced ridge on the profit map, but Tide's profit map is flatter and particularly flat along the current Purex price of $5.97.

Tide could use this information to pursue another competitive pricing tactic. It could willingly try to lower Purex's profits while keeping its own profits stable. Such a tactic could signal above-average performance in the industry, which might prompt positive impulses among financial investors. This rationale is also applicable when the market (temporarily) faces predatory competition, such as when the focal company's strategic marketing goal changes from absolute profit maximization to being relatively stronger than some competitor. Fig. 5 illustrates this particular pricing power of Tide over Purex and displays a profit difference function between them, calculated as Tide's profits minus Purex's profits at their respective price levels. For a manager, this profit difference map shows at which own and competitor price combinations the own brand makes more or less profit than the focal competitor. Tide could, for example, set a price at $8.80 and ensure that its profits are consistently higher than Purex's, independent of Purex's price.

Another perspective on the pricing problem of both Tide and Purex is portfolio price optimization. This scenario would be highly applicable to retailers and multi-product manufacturers with different product lines that compete in the same category. In reality, they mostly involve

Table 4
Profit optimal price changes for Advil at different scenarios.

Scenario	Description	Advil profit optimal price	Advil profit per consumer in the market
	Current prices		$ 1.61
(a)	Current competitor price level	$ 5.05	$ 3.02
(b)	Bayer increases price by $3	$ 5.25	$ 3.18
(c)	Bayer decreases price by $3	$ 3.65	$ 2.32
(d)	Tylenol increases price by $3	$ 5.00	$ 3.05
(e)	Tylenol decreases price by $3	$ 4.85	$ 2.85
(f)	Bayer and Tylenol increase price by $3	$ 5.25	$ 3.22
(g)	Bayer and Tylenol decrease price by $3	$ 3.65	$ 2.29

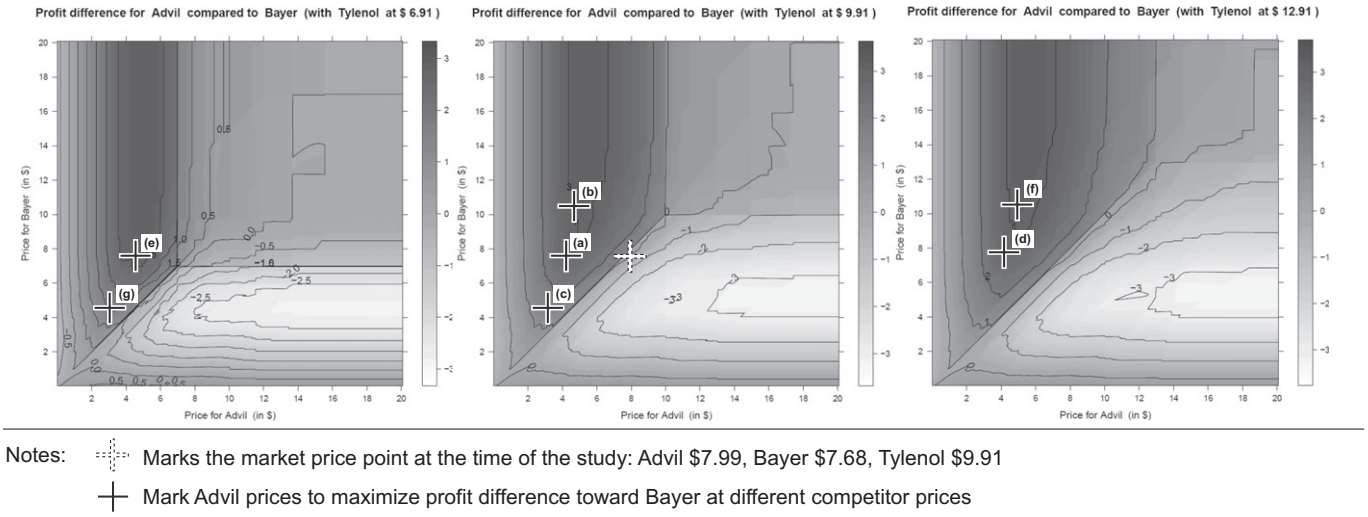


Fig. 11. Advil–Bayer profit difference maps at three different Tylenol prices.

more than two competing products, as in the second study, so the acting manager maximizes joint profits, joint revenues, or joint unit sales, depending on the strategy objective. This goal may require changing the price(s) of one or two products. That is, one product may lose profit, revenues, or unit sales while the other gains disproportionately. Fig. 6 combines both profit maps for joint profit maximization (left side) and also provides a joint revenue map, calculated with zero cost per sold product (right side).

Apparently, a manager maximizing joint profits or revenues first would have to raise the price for Purex, driving consumers away from choosing Purex and toward choosing Tide instead. This result highlights consumers' greater WTP for Tide compared with Purex. At a high enough price, Purex loses absolute attractiveness to consumers, and consumers mostly decide on the basis of Tide's price. The price for Tide also should be raised when optimizing for joint profit but lowered when optimizing for joint revenue. In a case in which a manufacturer wants to maximize joint product portfolio profits, but a retailer prefers to optimize joint revenues, this outcome points to a conflict of interest.

Both brands also could try to take advantage of consumer indecisiveness (Dost et al., 2014; Schlereth et al., 2012; Wathieu & Bertini, 2007) at certain price points. Indecisiveness can be overcome by additional (often non-price) cues, such as guarantees, reviews, or quality labels. Fig. 7 shows aggregated indecisiveness for both product prices. The different shades of grey mark the share of indecisive consumers at small price intervals. For example, at a price of $10 for Tide and $6 for Purex, 35% of consumers are indecisive about buying Tide or buying Purex. When attempting a marketing campaign aimed at leveraging consumer indecisiveness, the current price point is suboptimal. Tide should increase its price, but Purex should lower its price to support other marketing activities. This example demonstrates the different recommendations for marketing measures and their interaction with own and competitor's prices.

In summary, the price response maps calculated from multi-product WTP range distributions can (a) serve as an analytical tool for optimal pricing decisions under competition from both the focal company's and the competitor's standpoint, (b) devise pricing strategies in case of predatory competition, (c) reveal optimal product portfolio pricing and thereby uncover potential strategic conflicts along the value chain, and (d) recommend price points in support of non-pricing marketing activities.

4. Empirical study 2: more than two competing products

As a further illustration of the applicability of the proposed procedure, the second empirical study features more than two competing products.

4.1. Study setup

4.1.1. Design

Study 2 basically follows the same design and procedure as Study 1, differing only in the product category and number of products. This study uses three different, competing pain relief products, namely, packets of 100 tablets of Bayer aspirin (325 mg aspirin, current online price $7.68), Advil (200 mg ibuprofen, $7.99), and Tylenol (325 mg acetaminophen, $9.91). These three products are market leaders and also the highest priced products; generic versions with the same pharmaceutical agents are available at fractions of these branded products' prices. Thus, respondents' WTP ranges should be quite varied and

Table 5
Advil price changes to maximize profit difference toward Bayer.

Scenario	Description	Advil–Bayer profit difference–maximizing price	Advil–Bayer profit difference per consumer in the market	Comparison with Advil profit optimal price
	Current prices	$7.97	$0.11	
(a)	Current competitor price level	$4.25	$2.85	lower
(b)	Bayer increases price by $3	$5.25	$3.14	same
(c)	Bayer decreases price by $3	$3.65	$1.83	same
(d)	Tylenol increases price by $3	$4.25	$2.86	lower
(e)	Tylenol decreases price by $3	$4.25	$2.73	lower
(f)	Bayer and Tylenol increase price by $3	$5.25	$3.18	same
(g)	Bayer and Tylenol decrease price by $3	$3.65	$1.80	same

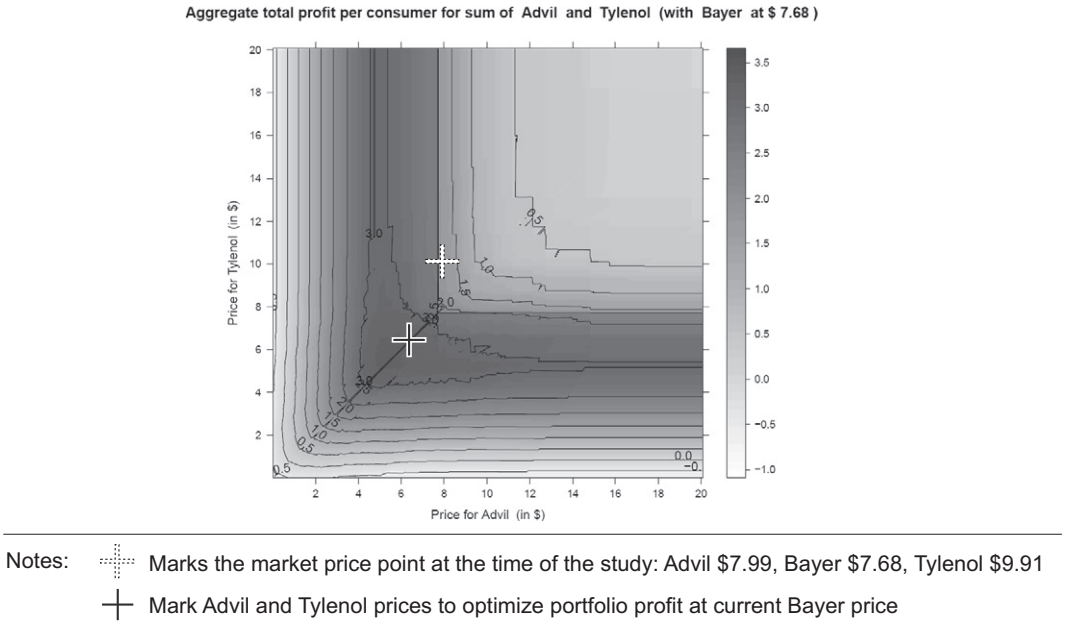


Fig. 12. Advil–Tylenol portfolio profit map at current Bayer price.

wide, implying consumer uncertainty again. The survey instrument was the same as in Study 1, except for the number and type of products.

4.1.2. Respondents and procedure

The 379 respondents, recruited from U.S. residents on MTurk, each received a reward of about $0.15 depending on the particular demand situation in MTurk. However, 139 respondents (36.7%) were excluded, because they (a) failed one or two fail-check items, (b) listed their floor and ceiling prices in the wrong order, (c) provided a totally unrealistic reference price of higher than $50, or (d) provided no WTP range but a point estimate instead. Self-reports indicated that the respondents were 66.7% women, with a mean age of 37.6 years (SD = 14.05), 62.9% reported having a college or higher degree, and the median monthly household income was $3500. Again, the sample is not representative but suitable to demonstrate the applicability of the proposed procedures.

4.1.3. Price response maps

Table 2 exhibits the three products' mean floor and ceiling reservation prices and their correlations. Again, the reservation prices for the different products are highly correlated.

Fig. 8 depicts the aggregated price response maps for the three products, which can be interpreted similarly to the price response maps in the two-product example (Fig. 2). That is, the aggregate choice probability for each brand reflects the estimated market share at the given prices. In the following maps, the price for the focal product is pitted against the price of the closest rival, with a third brand's price held constant at the current market price. The convenience sample predicts a

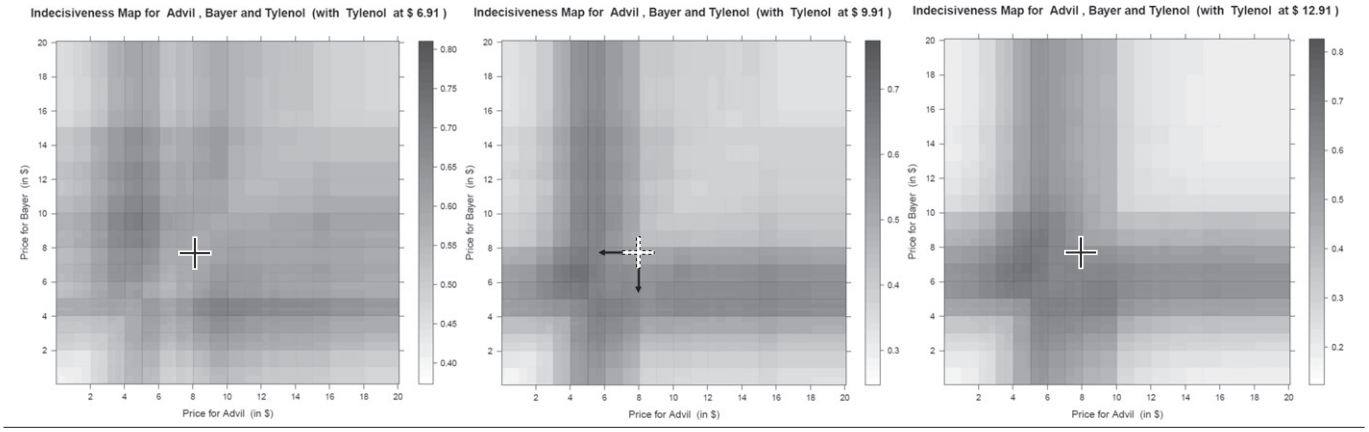


Fig. 13. Advil–Bayer consumer indecisiveness maps at three Tylenol prices.

market share of 22.0% for Advil (left-side map), 20.4% for Bayer (middle map), and 1.9% for Tylenol (right-side map) at current market prices, as marked by white crosses.

4.2. Managerial application

For pricing managers, these maps provide important information regarding consumers' reactions to own or competitors' price changes. These changes can be best illustrated by taking the view of the focal brand and considering rather large price changes. Fig. 9, taking the perspective of Advil, illustrates price changes of ±$3 for all brands, depicted by black crosses in the respective maps. The middle map at current Tylenol prices illustrates price changes by Advil (scenarios a and b) and Bayer (scenarios c and d); the right-side map signifies a price increase by Tylenol (scenario e) or both competitors (scenario g); and the map on the left depicts a price decrease by Tylenol (scenario f) or by both competitors (scenario h). For every other Tylenol price, a new map would need to be constructed and analyzed, or else pricing managers could just work with the underlying numbers. The same reasoning applies to competitive situations with more products: The main competitor can be depicted in a two-dimensional map, all other competitors are assumed to remain fixed at a given price, and for each new price (combination) of underlying competitors, a new map can be constructed.

The respective shifts in market share depending on those potential price changes (±$3) are summarized in Table 3. From the maps and the respective numbers, an Advil pricing manager could deduce that own price changes would lead to the greatest shifts in market share in terms of units sold, followed by Bayer price changes. Tylenol price changes, however, would only lead to a remarkable market share change for Advil if that price were lowered.

The pricing applications from the two-product scenario in Study 1 also can be illustrated in the current example. By multiplying the multi-product price response functions by units sold or a vector of profit margins (variable costs only assumed), revenue and profit maps can be created, such that either target variable may be optimized. The variable costs were estimated as 50% of the cheapest generic drug's price containing the same pharmaceutical agent for each branded product, that is, $0.64 for Advil, $0.37 for Bayer, and $0.81 for Tylenol.

Fig. 10 illustrates the profit maps for Advil. According to the middle map, the data from this convenience sample suggest that Advil could lower its price to $5.05 and achieve maximum profit. Given different competitor prices (±$3 current prices), other profit-optimal prices for Advil would evolve, as scenarios a–g in the maps in Fig. 10 reveal. The corresponding numbers are in Table 4.

As Fig. 10 and Table 4 reveal, with the present sample and assumed costs, current Advil prices are far from optimal. By lowering its own price from $7.99 to $5.05, the larger market share would increase Advil's average profit per consumer in the market from $1.61 to $3.02. Only a Bayer price cut ($3 in this example) would change this profit-optimal price considerably to $3.65. In contrast, Advil's profit-optimal price is quite robust against price changes by Tylenol and price increases by Bayer. Fig. 10 and Table 4 exhibit another interesting feature too: non-monotonic profit functions. Advil's profit-optimal price for both Tylenol price increases and cuts is lower than at the current Tylenol market price.

This three-product example also illustrates for which competitive price combinations Advil possesses superior pricing power over Bayer. Fig. 11 and Table 5 show the Advil–Bayer profit difference function at three Tylenol prices. For all described scenarios (a–g), Advil possesses superior pricing power over Bayer. More important, for the analyzed price changes by Bayer (±$3), Advil's profit difference–maximizing price is identical to its profit-maximizing price. Tylenol's price variation does not really affect Advil's considerations.

Moreover, Fig. 12 shows a portfolio profit map in which a retailer or manufacturer tries to optimize the total portfolio profit. In this example, the portfolio consists of Advil and Tylenol, and the map shows portfolio profits at the current Bayer price. If the Advil–Tylenol portfolio profit were to be maximized at current Bayer prices, the map and data would suggest selling Advil at $6.45 and Tylenol at $6.40, to earn an average of $3.24 per consumer in the market. At current prices, the average profit per consumer is $1.78 for the two brands combined.

Finally, Fig. 13 provides consumer indecisiveness maps for three competing products. The middle map, depicting consumer indecisiveness at current Tylenol prices, indicates that both Advil and Bayer could move into regions of higher consumer indecisiveness by lowering their current prices. The left- and right-side maps confirm this finding at lower and higher Tylenol prices too. In relation to the gray shading of all maps, Tylenol would have to increase its price to reach an adjacent area of higher consumer indecisiveness. As suggested previously, higher consumer indecisiveness implies a greater likelihood that consumers react to marketing stimuli other than price.

5. Discussion and directions for research

Few managers actually engage in value-based pricing, even though they recognize the potential benefits (Liozu et al., 2012). This research presents a procedure to create empirical, multi-product price response maps and suggests ways to use them for a variety of complex, value-based pricing decisions and tactics. The procedure addresses several key hurdles for implementing value-based pricing.

First, it accommodates the competitive nature of most pricing contexts by measuring an actual, joint multi-product WTP distribution without functional or other theoretical constraints. These distributions, visualized as maps, serve as bases for various value-based pricing activities in a competitive environment. The most straightforward application may be the optimization of a key metric of managerial interest, such as profit, revenue, or unit sales (e.g., Homburg et al., 2009), by setting an optimal price. Optimal pricing reactions to all possible competitor price changes are visible as well. With this perspective, the maps can serve as analytical tools to understand competitors' pricing options. Moreover, the price response maps and their derivatives can be used for more sophisticated pricing strategies than traditional textbook approaches. The maps can be modified to find pricing solutions that enable various aggressive pricing strategies. For example, a manufacturer might seek to set a price that is suboptimal for profit but that maximizes the profit difference relative to a competitor. Such a strategic pricing decision aims at outperforming the industry in relative terms, to help achieve financial performance goals (Schulze, Skiera, & Wiesel, 2012). Similarly, the approach presented here could be adapted to a predatory pricing strategy that seeks a price and cost combination that renders a competitor unprofitable while still maintaining the firm's own profit—thus legally avoiding a dumping strategy. Also for isolated pricing decisions, these maps can be used for portfolio price optimization, from a retailer's perspective. The latter may want to optimize managerial key metrics (profits, revenues) by optimizing the prices of two or more competing products that belong to the portfolio. Such an application also might uncover potential conflicts of interest between manufacturers and retailers in the same value chain.

Second, this approach shows how to make use of consumer indecisiveness in the face of competing products. By measuring WTP as a range, the procedure integrates consumer uncertainty into WTP distributions (Wang et al., 2007). Integrating uncertainty in WTP distributions is mandatory in the context of high uncertainty markets, such as those for experience and credence goods or new product introductions. These individual WTP ranges provide a measure of consumer indecisiveness, which is important information when deciding on matching marketing activities (Dost et al., 2014). Therefore, the concurrent use of the proposed multi-product price response maps (and their derivatives, such as profit maps) together with consumer indecisiveness maps would enable the integration of pricing and non-pricing activities in the face of competition.

Appendix A. R syntax for computing the maps

```
# R script for "Value-based pricing in competitive situations with the help of multi-product price-response maps" - Journal of Business Research

library(latticeExtra)

#+++++++++ PART I: PRICE RESPONSE MAPS ++++++++++++++++++++++++++++++++

#----load wtp data fom .csv-file---- (check for correct directory and filename)
loadeddata <- read.table("WTPstudy2.csv", header = TRUE, sep = ",") #here study 2
data <- edit(data.frame(loadeddata)) #check data in editor

#-----user settings-----------------
#FIRST: floor and ceiling reservation prices for brand on x-axis, y-axis and any other z-brand (not shown in map)
#here: study 2, x-axis: Advil, y Axis: Bayer, z-Axis (background): Tylenol
xFP <- data$FP_advil #floor prices
xCP <- data$CP_advil #ceiling prices
nameX <- "Advil" #Product Name for graphic

yFP <- data$FP_bayer
yCP <- data$CP_bayer
nameY <- "Bayer"

zFP1 <- data$FP_tylenol
zCP1 <- data$CP_tylenol
nameZ <- "Tylenol"

NoP <- 3 #Set number of brands/products for the maps (min 2)

#SECOND: set current price for all products
xprice <- 7.99
yprice <- 7.68
zprice1 <- 9.91 #here, price for Tylenol - $9.91

#THIRD: set vector of prices for algorithm, that is the later price range of the x-axis and y-axis
prices <- seq(0,20,0.05) #vector of prices used as a grid from $0 to $20 in 5 cent steps

#-----automated settings-----------------
n <- nrow(data) # Finds number of participants/individuals
```

```
FPresponse <- 0.95 # price response (probability) at floor price, to set up logistic functions. here: 95%

#------functions---------------
PR <- function(p,k,wtp){ #logistic function for price response, of price, k scale parameter and wtp; calculates choice probability.
prob <- 1/(1+(exp(-k*(p - wtp))))
return(prob)
}

#-----pre-algorithm calculations--------------
#calculate vectors of all WTPs

wtpX <- (xFP + xCP)/2
wtpY <- (yFP + yCP)/2
wtpZ1 <- (zFP1 + zCP1)/2

#calculate k (scale parameter) for logistic function

kX <- (-log((1/FPresponse)-1))/((xFP)-(wtpX))
kY <- (-log((1/FPresponse)-1))/((yFP)-(wtpY))
kZ1 <- (-log((1/FPresponse)-1))/((zFP1)-(wtpZ1))

#-----CALCULATE PRICE RESPONSE MAP-----------

MapX <- matrix(0,nrow = length(prices), ncol = length(prices))

for (i in 1:n) { #for over all respondents: (i in 1:n), level 1
tempresponseX <-numeric()
tempresponseY <-numeric()
tempresponseZ1 <-numeric()

tempresponseX <- PR(prices,kX[i],wtpX[i])
tempresponseY <- PR(prices,kY[i],wtpY[i])
if (NoP == 3) { tempresponseZ1 <- PR(zprice1,kZ1[i],wtpZ1[i]) } else {tempresponseZ1 <-0
}

tempMapX <- matrix(,nrow = length(prices), ncol = length(prices))

for (p1 in 1:length(prices)) { #for over all X prices, per respondent, level 2, rows in matrix; in map:x-axis
for (p2 in 1:length(prices)) { #for over all Y prices, per respondent, level 3, columns in matrix in map:y axis
if ((tempresponseX[p1] > tempresponseY[p2]) & (tempresponseX[p1] > tempresponseZ1))
{tempMapX[p1,p2] <- tempresponseX[p1]}
```

```
else {tempMapX[p1,p2] <- 0}
} #end for over all prices, level 3
} #end for over all prices, level 2

# ---aggregating over respondents ----
MapX <- MapX + tempMapX
} #end for over all respondents, level 1

#-----average over respondents ------------
MapX <- MapX/n

#-------save map to file----------------
write.csv(MapX, file=paste(nameX,"PRMap.csv"), row.names = prices)

#-------output graph: price response map----------------
Lprices <- seq(0,nrow(MapX),40) #axis label generator
pricelabels <- seq(0,20,2)
levelplot(MapX, cuts = 49, col.regions = gray(100:20/100), main = paste("Aggregate price
response for ",nameX, " (with ",nameZ," at $",zprice1,")"), xlab = paste("Price for",nameX,"
(in $)"), ylab = paste("Price for",nameY," (in $)"), scales = list(x=list(at=Lprices, labels =
pricelabels),y=list(at=Lprices, labels = pricelabels)))+ as.layer(contourplot(MapX, cuts = 10))

#+++++++++ END OF PART I: PRICE RESPONSE MAPS ++++++++++++++++++++++

#+++++++++ PART II: INDECISIVENESS MAPS ++++++++++++++++++++++++++++

MapIndec <- matrix(0,nrow = length(prices), ncol = length(prices))

for (i in 1:n) { #for over all respondents: (i in 1:n), level 1

tempMapIndec <- matrix(,nrow = length(prices), ncol = length(prices))

for (p1 in 1:length(prices)) { #for over all X prices, per respondent, level 2, rows in matrix; in
map:x-axis
for (p2 in 1:length(prices)) { #for over all Y prices, per respondent, level 3, columns in matrix
in map:y axis

if (((prices[p1] >= xFP[i]) & (prices[p1] <= xCP[i])) | ((prices[p2] >= yFP[i]) & (prices[p2]
<= yCP[i]))| ( ( zprice1 >= zFP1[i]) & ( zprice1 <= zCP1[i]) ) ) {tempMapIndec[p1,p2] <-1}
else {tempMapIndec[p1,p2] <-0}

} #end for over all prices, level 3
} #end for over all prices, level 2

# ---aggregating over respondents ----
```

```
MapIndec <- MapIndec + tempMapIndec

} #end for over all respondents, level 1

#-----average over respondents ------------
MapIndec <- MapIndec/n

#-------save map to datafile----------------
write.csv(MapIndec, file=paste(nameX,"IndecisivenessMap.csv"), row.names = prices)

#-------output graph: indecisiveness map----------------
Lprices <- seq(0,nrow(MapX),40) #axis label generator
pricelabels <- seq(0,20,2)
levelplot(MapIndec, cuts = 49, col.regions = gray(100:20/100), main = paste("Indecisiveness
Map for ",nameX, ",", nameY,"and",nameZ," (with ",nameZ," at $",zprice1,")"), xlab =
paste("Price for",nameX," (in $)"), ylab = paste("Price for",nameY," (in $)"), scales =
list(x=list(at=Lprices, labels = pricelabels),y=list(at=Lprices, labels = pricelabels)))

#+++++++++ END OF PART II: INDECISIVENESS MAPS ++++++++++++++++++++++

#+++++++++ PART III: OTHER MAPS - PROFIT, REVENUE, PORTFOLIO ++++++++

#-------load data from file ------------
MapX <- as.matrix(read.csv("AdvilBayer_AdvilPerspectiv PRMap.csv", row.names = 1, sep
= ","))
MapY <- as.matrix(read.csv("AdvilBayer_BayerPerspective PRMap.csv", row.names = 1, sep
= ","))

#-----Set prices for labels and maps
prices <- seq(0,nrow(MapX),40) #axis label generator
pricelabels <- seq(0,20,2)
pricelevels <- seq(0,20,0.05)
ysteps <- which.min(abs(pricelevels - yprice)) # current column in Map matrix
xsteps <- which.min(abs(pricelevels - xprice)) # current row in Map matrix
pY <- matrix(rep(pricelevels,length(pricelevels)), ncol =length(pricelevels), byrow=TRUE)
pX <- matrix(rep(pricelevels,length(pricelevels)), ncol =length(pricelevels), byrow=FALSE)

#-------revenue maps----------
MapRevX <- MapX * pX
MapRevY <- MapY * pY
MapRevTotal <- MapRevX + MapRevY #Portfolio Map

#levelplot(MapRevX, cuts = 49, col.regions = gray(100:20/100), main = paste("Average
Revenue per Consumer for ",nameX, " (with ",nameZ," at $",zprice1,")"), xlab = paste("Price
for",nameX," (in $)"), ylab = paste("Price for",nameY," (in $)"), scales = list(x=list(at=prices,
```

```
labels = pricelabels),y=list(at=prices, labels = pricelabels)))+ as.layer(contourplot(MapRevX,
cuts = 10))
#levelplot(MapRevY, cuts = 49, col.regions = gray(100:20/100), main = paste("Average
Revenue per Consumer for ",nameY, " (with ",nameZ," at $",zprice1,")"), xlab = paste("Price
for",nameY," (in $)"), ylab = paste("Price for",nameX," (in $)"), scales = list(x=list(at=prices,
labels = pricelabels),y=list(at=prices, labels = pricelabels)))+ as.layer(contourplot(MapRevY,
cuts = 10))
#levelplot(MapRevTotal, cuts = 49, col.regions = gray(100:20/100), main = paste("Average
Total Revenue per Consumer for sum of ",nameX,nameY, " (with ",nameZ," at
$",zprice1,")"), xlab = paste("Price for",nameX," (in $)"), ylab = paste("Price for",nameY,"
(in $)"), scales = list(x=list(at=prices, labels = pricelabels),y=list(at=prices, labels =
pricelabels)))+ as.layer(contourplot(MapRevTotal, cuts = 10))

#-------profit maps----------
MapProfX <- MapX * (pX - 0.645) # variable cost of 0.645
MapProfY <- MapY * (pY - 0.364) # variable cost of 3
MapProfTotal <- MapProfX + MapProfY #Portfolio Map
MapProfitDifference <- MapProfX - MapProfY #Profit difference map (for strategic pricing)

#levelplot(MapProfX, cuts = 49, col.regions = gray(100:20/100), main = paste("Profit per
Consumer for ",nameX, " (with ",nameZ," at $",zprice1,")"), xlab = paste("Price for",nameX,"
(in $)"), ylab = paste("Price for",nameY," (in $)"), scales = list(x=list(at=prices, labels =
pricelabels),y=list(at=prices, labels = pricelabels)))+ as.layer(contourplot(MapProfX, cuts =
10))
#levelplot(MapProfY, cuts = 49, col.regions = gray(100:20/100), main = paste("Profit per
Consumer for ",nameY, " (with ",nameZ," at $",zprice1,")"), xlab = paste("Price for",nameY,"
(in $)"), ylab = paste("Price for",nameX," (in $)"), scales = list(x=list(at=prices, labels =
pricelabels),y=list(at=prices, labels = pricelabels)))+ as.layer(contourplot(MapProfY, cuts =
10))
#levelplot(MapProfTotal, cuts = 49, col.regions = gray(100:20/100), main = paste("Aggregate
total profit per consumer for sum of ",nameX,nameY, " (with ",nameZ," at $",zprice1,")"),
xlab = paste("Price for",nameX," (in $)"), ylab = paste("Price for",nameY," (in $)"), scales =
list(x=list(at=prices, labels = pricelabels),y=list(at=prices, labels = pricelabels)))+
as.layer(contourplot(MapProfTotal, cuts = 10))
#levelplot(MapProfitDifference, cuts = 49, col.regions = gray(100:20/100), main =
paste("Profit difference for ",nameX," compared to ",nameY, " (with ",nameZ," at
$",zprice1,")"), xlab = paste("Price for",nameX," (in $)"), ylab = paste("Price for",nameY,"
(in $)"), scales = list(x=list(at=prices, labels = pricelabels),y=list(at=prices, labels =
pricelabels)))+ as.layer(contourplot(MapProfitDifference, cuts = 10))

#+++++++++ END OF PART III ++++++++++++++++++++++++++++++
```

Overall, the approach presented in this research could be improved and extended in several ways. This study demonstrates the predictive validity of the WTP range-based measurement approach with non-incentive–aligned WTP measurements and hypothetical choices among non-representative samples. An externally valid empirical map requires representative data. The (often costly) use of representative sampling techniques thus seems mandatory. As an upside, this research demonstrates that an approach using WTP ranges favorably reduces sample size requirements.

Incentive-aligned methods for WTP range measurement are readily available, though they are as unwieldy as any lottery-based methods (Wertenbroch & Skiera, 2002). New and simpler methods for valid WTP range measures present avenues for further research. For example, applying a "Bayesian Truth Serum" (Prelec, 2004; Weaver & Prelec, 2013) to WTP range measurements may represent a fruitful endeavor.

Finally, the multi-product price response maps and their derivatives can be used for a variety of market simulations. In the present example, a manufacturer could set a static price, maximizing a key metric of managerial interest, such as profit, or pursuing other strategies (outperforming, portfolio optimization). However, this study ignores the dynamic nature of the market, especially with regard to competitor responses. An interesting future application of multi-product WTP distributions thus may lie in varying the relevant parameters for actual price movements over time. Exemplary parameters worth analyzing might include the time lag of competitor reactions, the order of competitor reactions, or competitors' key metrics (e.g., profit vs. revenue maximization). In such a market response model, a focal company's pricing manager could move from a comparative, static perspective to a dynamic model in which the key variable of managerial interest is optimized over time, given specific competitor reactions at certain points in time.

Acknowledgments

The authors thank Robert Wilken for commenting on a previous version of this manuscript. Elisabeth Nevins served as copyeditor for this manuscript.

References

Anderson, J. C., Jain, D. C., & Chintagunta, P. K. (1993). Customer value assessment in business markets: A state-of-practice study. *Journal of Business-to-Business Marketing*, *1*(1), 3. http://dx.doi.org/10.1300/J033v01n01_02.

Dost, F., & Wilken, R. (2012). Measuring willingness to pay as a range, revisited: When should we care? *International Journal of Research in Marketing*, *29*(2), 148–166. http://dx.doi.org/10.1016/j.ijresmar.2011.09.003.

Dost, F., Wilken, R., Eisenbeiss, M., & Skiera, B. (2014). On the edge of buying: A targeting approach for indecisive buyers based on willingness-to-pay ranges. *Journal of Retailing*, *90*(3), 393–407. http://dx.doi.org/10.1016/j.jretai.2014.03.007.

Hauser, J. R., & Urban, G. L. (1986). The value priority hypotheses for consumer budget plans. *Journal of Consumer Research*, *12*(4), 446–462. http://dx.doi.org/10.2307/254304.

Homburg, C., Koschate, N., & Hoyer, W. D. (2005). Do satisfied customers really pay more? A study of the relationship between customer satisfaction and willingness to pay. *Journal of Marketing*, *69*(2), 84–96. http://dx.doi.org/10.1509/jmkg.69.2.84.60760.

Homburg, C., Kuester, S., & Krohmer, H. (2009). *Marketing management—A contemporary perspective*. London: McGraw-Hill.

Jedidi, K., & Jagpal, S. (2009). Willingness to pay: Measurement and managerial implications. In V. R. Rao (Ed.), *Handbook of pricing research in marketing* (pp. 37–60). Cheltenham: Edward Elgar Publishing.

Jedidi, K., & Zhang, Z. J. (2002). Augmenting conjoint analysis to estimate consumer reservation price. *Management Science*, *48*(10), 1350–1368. http://dx.doi.org/10.1287/mnsc.48.10.1350.272.

Kapelner, A., & Chandler, D. (2010). Preventing satisficing in online surveys. *Proceedings of 2010 CrowdConf*.

Liozu, S. M., Hinterhuber, A., Perelli, S., & Boland, R. (2012). Mindful pricing: Transforming organizations through value-based pricing. *Journal of Strategic Marketing*, *20*(3), 197–209. http://dx.doi.org/10.1080/0965254X.2011.643916.

Maier, E., Wilken, R., & Dost, F. (2015). The double benefits of consumer certainty: Combining risk and range effects. *Marketing Letters*, *26*(4), 473–488. http://dx.doi.org/10.1007/s11002-014-9282-5.

Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's Mechanical Turk. *Behavior Research Methods*, *44*(1), 1–23. http://dx.doi.org/10.3758/s13428-011-0124-6.

Miller, K. M., Hofstetter, R., Krohmer, H., & Zhang, Z. J. (2011). How should consumers' willingness to pay be measured? An empirical comparison of state-of-the-art approaches. *Journal of Marketing Research*, *48*(1), 172–184. http://dx.doi.org/10.1509/jmkr.48.1.172.

Moorthy, S., Ratchford, B. T., & Talukdar, D. (1997). Consumer information search revisited: Theory and empirical analysis. *Journal of Consumer Research*, *23*(4), 263–277. http://dx.doi.org/10.2307/2489564.

Park, J. H., MacLachlan, D. L., & Love, E. (2011). New product pricing strategy under customer asymmetric anchoring. *International Journal of Research in Marketing*, *28*(4), 309–318. http://dx.doi.org/10.1016/j.ijresmar.2011.04.003.

Porter, M. E. (1985). *Competitive advantage—Creating and sustaining superior performance*. New York: Free Press.

Prelec, D. (2004). A Bayesian truth serum for subjective data. *Science*, *306*(5695), 462–466. http://dx.doi.org/10.2307/3839317.

Rao, V. R., & Kartono, B. (2009). Pricing objectives and strategies: A cross-country survey. In V. R. Rao (Ed.), *Handbook of pricing research in marketing* (pp. 9–36). Cheltenham: Edward Elgar.

Schlereth, C., Eckert, C., & Skiera, B. (2012). Using discrete choice experiments to estimate willingness-to-pay intervals. *Marketing Letters*, *23*(3), 761–776. http://dx.doi.org/10.1007/s11002-012-9177-2.

Schulze, C., Skiera, B., & Wiesel, T. (2012). Linking customer and financial metrics to shareholder value: The leverage effect in customer-based valuation. *Journal of Marketing*, *76*(2), 17–32. http://dx.doi.org/10.1509/jm.10.0280.

Shaffer, G., & Zhang, Z. J. (1995). Competitive coupon targeting. *Marketing Science*, *14*(4), 395–416. http://dx.doi.org/10.2307/184137.

Varian, H. R. (1992). *Intermediate microeconomics* (3rd ed.). New York: W.W. Norton & Company.

Voelckner, F. (2006). An empirical comparison of methods for measuring consumers' willingness to pay. *Marketing Letters*, *17*, 137–149. http://dx.doi.org/10.1007/s11002-006-5147-x.

Wang, T., Venkatesh, R., & Chatterjee, R. (2007). Reservation price as a range: An incentive-compatible measurement approach. *Journal of Marketing Research*, *44*(2), 200–213. http://dx.doi.org/10.1509/jmkr.44.2.200.

Wathieu, L., & Bertini, M. (2007). Price as a stimulus to think: The case for willful overpricing. *Marketing Science*, *26*(1), 118–129. http://dx.doi.org/10.2307/40057077.

Weaver, R., & Prelec, D. (2013). Creating truth-telling incentives with the Bayesian truth serum. *Journal of Marketing Research*, *50*(3), 289–302. http://dx.doi.org/10.1509/jmr.09.0039.

Wertenbroch, K., & Skiera, B. (2002). Measuring consumers' willingness to pay at the point of purchase. *Journal of Marketing Research*, *39*(2), 228–241. http://dx.doi.org/10.1509/jmkr.39.2.228.19086.

Wilken, R., & Sichtmann, C. (2007). Estimating willingness-to-pay with different utility functions — A comparison of individual and cluster solutions. *ESCP-EAP Working Paper No. 33*.

Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing*, *52*(3), 2–22. http://dx.doi.org/10.2307/1251446.

Journal of Business Research 76 (2017) 237–246

Contents lists available at ScienceDirect

Journal of Business Research

Barriers to implementing value-based pricing in industrial markets: A micro-foundations perspective

Pekka Töytäri [a,*], Joona Keränen [b], Risto Rajala [a]

[a] Aalto University, School of Science, Department of Industrial Engineering and Management, P.O. Box 15500O, FI-00076 Aalto, Finland
[b] Lappeenranta University of Technology, School of Business and Management, P.O. Box 20, 53851 Lappeenranta, Finland

ARTICLE INFO

Article history:
Received 16 September 2015
Received in revised form 13 March 2016
Accepted 12 April 2016
Available online 17 January 2017

Keywords:
Value-based pricing
Individual barriers
Institutional logic
Micro-foundations
Industrial markets

ABSTRACT

Value-based pricing has the potential to improve differentiation, profitability, and value creation for industrial firms and their customers. However, while most of the pricing research considers the ways organizations set or get value-based prices, only few studies consider how individual managers influence the pricing process and what prevents them from setting and getting value-based prices. This is of critical concern, since it is not just organizations, but individuals within organizations who make pricing decisions—and their decision-making is influenced by institutional pressures such as socially prescribed norms, rationalized meanings, and beliefs about profitable approaches to pricing. This study addresses this gap in the current knowledge by adopting a micro-foundations perspective to pricing, and focusing on the barriers that individual managers encounter when implementing value-based pricing. Drawing on a single case study in a global industrial firm, and from interviews with 24 managers, this study identifies 11 individually, organizationally, and externally induced barriers to value-based pricing. The study also sheds light on the potential sensegiving strategies for overcoming these barriers.

1. Introduction

Product commoditization in industrial markets tends to drive pricing towards cost- and competition-based logics. In addition, the increased sophistication and purchasing power of buyers often lead to decreased margins, and to the diminished profitability of suppliers and service providers (Hinterhuber & Liozu, 2012; Ingenbleek & van der Lans, 2013). Consequently, leading industrial firms are adopting value-based business strategies to differentiate themselves from competitors and stay profitable (Anderson, Narus, & van Rossum, 2006; Keränen & Jalkala, 2014), but currently we still know little about what drives or prevents firms from adopting value-based pricing logics in industrial markets (Hinterhuber, 2008; Töytäri, Rajala, & Brashear Alejandro, 2015).

Prior literature suggests that industrial firms can facilitate the implementation of value-based pricing by developing and deploying corresponding resources and organizational capabilities (e.g., Dutta, Zbaracki, & Bergen, 2003; Johansson, Keränen, Hinterhuber, Liozu, & Andersson, 2015; Töytäri & Rajala, 2015). Given that capabilities are usually deployed through organizational routines and processes (Helfat et al., 2009; Winter, 2003). Recent research has investigated the organizational and institutional barriers that may impede value-based pricing (Töytäri et al., 2015). However, while the existing studies have looked at how organizations can implement value-based pricing, there is limited research on the role of individuals in this process. This is an important gap in the extant literature, since organizations do not implement pricing, individuals do (Hinterhuber and Liozu, 2017; Lancioni, Schau, & Smith, 2005).

In the literature on micro-foundations in strategic management (Felin & Foss, 2005; Hodgson, 2012), it is actors within organizations who are considered to enact temporary habits and practices that may become permanent organizational routines. In other words, such practices may become capabilities vested in the organization. Although many actors perceive value-based pricing as an appealing alternative to the traditional market- or cost-based pricing, sometimes deeply held beliefs among stakeholders may hinder the adoption of value-based pricing (Töytäri et al., 2015). While previous literature has shed light on the roles individuals may play in organizational change, there is a need for deeper understanding of the ways individuals may support or hinder the adoption of value-based pricing.

To fill this gap, this study explores the barriers to the implementation of value-based pricing that individual actors face in organizations. Our empirical study is focused on the intensely competitive industrial business-to-business exchange, where competing institutional logics

* Corresponding author.
E-mail addresses: pekka.toytari@aalto.fi (P. Töytäri), joona.keranen@lut.fi (J. Keränen), risto.rajala@aalto.fi (R. Rajala).

http://dx.doi.org/10.1016/j.jbusres.2016.04.183
0148-2963/

typically co-exist (Besharov & Smith, 2014). To address our research objective, we conducted a qualitative single-case study, and interviewed 24 managers in an industrial firm in the metals industry that has made significant investments into implementing value-based selling and pricing strategies.

The findings from this study illustrate different types of barriers to the adoption of value-based pricing, and the corresponding sensemaking strategies that firms can use to overcome those barriers. For scholars, the findings make important and novel contributions to the pricing and micro-foundations literature by illuminating the individually experienced barriers that create resistance to change towards value-based pricing logic, and examining how individual perceptions may influence the implementation of organizational change toward value-based exchange (Hinterhuber, 2008; Powell, Lovallo, & Fox, 2011; Töytäri et al., 2015). For practitioners, the findings provide insights into the ways managers can resolve the intrinsic and extrinsic conflicts of competing logics in their efforts to infuse business models with value-based pricing.

2. Conceptual background

2.1. Alternative pricing logics

Pricing is the key mechanism to share the value created between the customer and the supplier. The value created and the supplier cost define the available range to determine price (e.g., Kortge & Okonkwo, 1993) The literature identifies three types of pricing logic: cost-based, competition-based (or market-based), and value-based (Hinterhuber, 2008). The cost-based pricing logic is based on the calculus of the supplier's own costs as a pricing reference, and adds a target margin to arrive at the price. The competition- or market-based approach monitors the market prices of comparable offerings, and sets the price by focusing on the characteristics of the offering and its competitive position in the market (Liozu, Hinterhuber, Boland, & Perelli, 2012). They are usually the prevailing logics in the mature, commoditized, and goods-exchange dominant industrial markets, and characterized by low price and cost reductions, short-term value capture through increased bargaining power, buyer-driven interactions, and narrow conception of value (Anderson, Narus, & Wouters, 2014; Rajala, Töytäri, & Hervonen, 2015)

Value-based pricing logic, in contrast, is characterized by long-term and service-based exchange, relationship focus, value creation based on a holistic and shared value conception, seller-driven initiation of relationships, and an even power balance (Anderson, Wouters, & van Rossum, 2010; Töytäri et al., 2015). Value-based pricing logic requires a profound understanding of a customer's business model, business drivers, and processes, and ultimately, what customers value, instead of focusing on product/service attributes and a supplier's competitive position. However, despite its potential benefits to supplier–customer relationships, value-based pricing logics are rarely applied in industrial markets (Hinterhuber & Liozu, 2012).

Previous research has explored how value-based pricing can be implemented externally in supplier–customer relationships, and highlighted the role of proactivity, access to key stakeholders, quantifiable value propositions, trust, and differentiated relationships and/or offerings (Dutta et al., 2003; Hinterhuber & Liozu, 2012; Töytäri & Rajala, 2015). However, before an organization's value-based pricing logics can be deployed externally, they need to be adopted internally. Value-based pricing logic is an inherently more complex approach to pricing than cost- and competition-based logics, and requires new capabilities and organizational practices, and changes in a firm's business model and customer relationship management (Liozu et al., 2012; Nenonen & Storbacka, 2010). Essentially, the internal adoption and implementation of value-based pricing requires capabilities to adopt the change (Teece, 2007), capabilities and resources to implement and sustain the change, and a profound change in the firm's institutional logic that shapes its beliefs, attitudes, practices and actions (Thornton, Ocasio, & Lounsbury, 2012).

2.2. Institutional logics and value-based pricing

Institutional logic is defined as a socially constructed set of material practices, assumptions, values, and beliefs that shapes cognition and behaviour (Thornton et al., 2012). In the institutional theory literature, institutional logics have been seen as guiding individual actors' beliefs, attitudes, decisions, and actions. In addition, institutional logics have been suggested to influence the way in which individual actors make sense of their environment and evaluate their decision options on the basis of the underlying schemas of reasoning. The institutional tradition in organization theory views both institutions and organizations as products of common understandings and shared interpretations of acceptable norms of collective activity (Suddaby, Elsbach, Greenwood, Meyer, & Zilber, 2010).

Institutional logics serve as the interpretation schema for individual actors in organizations. As such, they guide the beliefs, attitudes, decisions, and actions of individual actors. Accordingly, individual actors make sense of their environment and evaluate their decision options on the basis of their adopted logic. Institutional theorists have argued that organizational fields are organized by a dominant logic (Reay & Hinings, 2009), and that institutional change is effectuated by a change in the dominant logic. Hence, most scholars explain institutional change as a transition from one dominant logic to another (Townley, 2002). However, a presence of multiple logics within organizational fields and in organizations is common in contemporary business markers (Reay & Hinings, 2009). Different logics may coexist for longer periods of time, blend, or compete, with different consequences for organizations (Besharov & Smith, 2014).

As value-based pricing is linked to the expected benefits to the customer as a pricing reference, it represents a different logic of pricing compared to those that focus on a supplier's own costs of production, or market prices. Value-based pricing has the potential to be favorable to both the buyer and the supplier (Anderson et al., 2010). For buyers, it emphasizes the realized value, and often gives suppliers an incentive to maximize the value created for buyers. For suppliers, it may increase the supplier's share of the customer wallet and the supplier's share of the value created in individual supplier–customer interactions (Terho, Haas, Eggert, & Ulaga, 2012). However, for industrial buyers, the cost- and competition-based pricing logic is the established institutional norm. Mature industrial relationships are characterized by repeat buying, competitive alternatives, and high buyer power. These forces drive prices toward low supplier margins. Industrial buyers tend to perceive cost or market-based prices as fair, and value-based sharing of the value may sometimes be perceived as unfair and greedy. This view is often shared by the supplier's representatives who interact with customers (Töytäri et al., 2015).

2.3. Micro-foundations of pricing

The micro-foundations perspective in strategic management literature asserts that organizational strategies and capabilities are the result of individual actors' activities and behaviors (Felin & Foss, 2005; Hodgson, 2012). That is, the way in which individuals act and behave over time defines and shapes the patterns of collective behavior in organizations, which in turn, are manifested as organizational routines and capabilities (Barney, 1991; Teece, 2007; Teece, Pisano, Shuen, & Wiley, 1997) once they become formalized or the norms of daily activities (Abell, Felin, & Foss, 2008; Alvesson, 2011). The capabilities and routines then cause the firm-level outcomes, such as strategies, business performance, and pricing strategies (Abell et al., 2008; Nelson & Winter, 1982). This means that individual activities, cognitive capabilities, sensemaking, and interpretation, whether intentional or unintentional,

play a central role in the development of new organizational capabilities and the adoption of different pricing logics inside the firm.

If individuals in the supplier's organization accept or buy into the belief that value-based pricing is difficult, impossible, or goes against the customer's grain (Hinterhuber, 2008; Töytäri et al., 2015) they may voluntarily accept an alternative pricing logic, which is more likely to result an immediate sale. Similarly, powerful or more experienced buyers may enforce conditions which favor cost- or competition-based pricing logics (Steiner, Eggert, Ulaga, & Backhaus, 2014). When individuals adopt a pattern of behavior, it slowly becomes a norm, becomes "engrained in firm DNA" and may become the dominant form of action in individual organizations or even entire industries (Liozu et al., 2012, p.9).

However, accepting cost- or competition-based pricing as the prevailing institutional logics often emphasizes short-term value capture, and may neglect or endanger the long-term value potential for both the supplier and the buyer (Töytäri et al., 2015). For buyers or purchasing managers this may be appealing at first, as they have to make purchasing decisions with limited information and time, and might have an incentive for short-term cost savings or to remain within the purchasing budget. But for suppliers who want to differentiate or extract a premium, this emphasizes the need to legitimize value-based pricing logic as a viable alternative, first for the individuals inside the supplier's own organization, and then among the customers. This is especially important for industrial firms in developed countries, which often sell higher value and higher priced offering (Anderson & Wynstra, 2010).

2.4. Legitimizing value-based pricing

If progressive and pricing-savvy managers want to foster the adoption of a value-based pricing in their institutional environment, they need to first legitimize it within their own organizations. Mindful leaders can facilitate the implementation of value-based pricing by influencing how individual actors within an organization make sense of their frame of reference – that is, the dominant or target pricing logic – and overcome barriers that might create resistance (Liozu & Hinterhuber, 2013; Liozu et al., 2012).

Previous research in sensemaking (Gioia & Chittipeddi, 1991) has explored how managers construct meanings for others for a preferred redefinition of the organizational reality. In this regard, sensemaking refers to the meanings that individuals construct and through which they understand changes in social action and institutional structures (Maitlis, 2005). Sensemaking occurs when organizational members confront events, issues, and actions that are unexpected or confusing, such as conflicting pricing logics (Gioia & Thomas, 1996).

If managers want to influence others' frame of reference, they need to be able to influence how those others make sense of their social reality. This is "sensegiving," a process by which individuals attempt to influence the sensemaking of others toward a preferred redefinition of the used schemas of reasoning (Gioia & Chittipeddi, 1991; Maitlis & Lawrence, 2007). From the perspective of the legitimacy of value-based pricing, sensemaking based on the schemas of reasoning that are grounded in the prevailing market-based or cost-based logics of pricing can be seen as cognitive barriers to the new (value-based) logic of pricing, because such schemas of reasoning may have become institutionalized to the extent that they represent socially prescribed norms. Hence, they may have become the only legitimate ways of pricing, and their rationalized meanings may include beliefs that many actors would never question.

In the institutional theory literature, there is a clear focus on the processes of institutionalization, which are often linked with the legitimation of new schemes of reasoning. Many studies of institutionalization emphasize the agentic perspective (Suddaby et al., 2010). The agency related to sensegiving can be distinguished into leader and stakeholder sensegiving, each fueling sensemaking processes with a particular form of social action (Maitlis, 2005). Leader sensegiving produces controlled, highly organized, systematic processes through private, one-on-one interactions between leaders and stakeholders. Conversely, stakeholder sensegiving animates sensemaking processes so that information flows among participants and the process remains continuously active over the life of the business issues (Maitlis, 2005). We suggest that stakeholder sensemaking and sensegiving play a key role in the introduction of the value-based pricing logic to an organization and in establishing it as the dominant pricing logic both inside the organization and within supplier–customer relationships.

3. Methodology

To explore the barriers to value-based pricing that individual actors perceive in inter-organizational exchange, we used a qualitative, single-case study research design, which enables us to delve deep into the social reality in organizational setting, and examine how individuals experience and make sense of everyday pricing issues. Given that value-based pricing is a contemporary phenomenon, and an area in which practice is well ahead of research, an exploratory research approach is best suited to develop a preliminary theory from managerial insights (Corbin & Strauss, 2015).

3.1. Case selection

The selection of the actual case and the unit of analysis is a critical aspect of case study research, as it binds the research phenomenon to its real-life setting (Creswell, 2013, p.97). Therefore, we employed theoretical sampling, and used several criteria to select a relevant and empirically rich case (Eisenhardt & Graebner, 2007). Consequently, we selected a firm that 1) employs value-based pricing with at least some of their customers, 2) has practiced value-based pricing for at least five years to have both broad and deep understanding of the potential challenges associated with it, and 3) would grant deep and intensive research access to senior management and potential customers. Based on these criteria, we selected a strategic business unit of MetalComp, a pseudonym for a globally operating industrial firm that offers products, services and solutions for customers from original manufacturers to end users in a variety of industries. The main company has more than 40, 000 employees in more than 100 countries, and we focus on the regional sales and services unit (hereafter referred as the case company), which has around 200 employees and 15 salespeople, and manages MetalComp's Finnish customers, including metals, pulp and paper, mining and marine industries. The case company has been investing in development of its value-based capabilities for more than a decade, hence providing a salient context to study the challenges of the adoption of value-based pricing. In this study, our focal unit of analysis is an individual manager in the case company.

Our case selection supports the logic of particularly revelatory case (Eisenhardt & Graebner, 2007), as the case company has been historically very product-oriented, but increasing commoditization and competition have forced it to make significant efforts in making the transition from a cost-based to a value-based pricing logic. The transformation features services and solutions, customer value quantification, and pricing based on value. Most of our informants associate the transformation toward value-based pricing with service or value selling, which is also highlighted in their interview quotes. Furthermore, MetalComp is widely known as an industry frontrunner in this change and in implementation of value-based selling and pricing. However, despite visible support from top management, the case company has been experiencing difficulties in rooting the value-based pricing logic as a manifestation of the dominant institutional logic inside the organization.

3.2. Data collection

Data collection took place in three stages. First, we conducted an extensive literature review on value-based pricing, organizational and institutional change, micro-foundations, and sense-making strategies. This provided us with preliminary insights from the literature, and guided our subsequent data collection insights (Corbin & Strauss, 2015). Second, we selected a case company that would help us to address the gaps in the literature, and analyzed the case company's internal documents, sales tools and industry position with aim of looking for empirical evidence of strategies, practices, and decisions related to value-based pricing.

Finally, we conducted 20 semi-structured interviews with supplier managers at different organizational positions, to gain a comprehensive view of how individuals in the selected empirical setting experienced, interpreted, and made sense of decisions related to value-based pricing. We complemented the supplier interviews with four customer interviews to explore and confirm whether customers had similar (or different) experiences and perceptions of value-based pricing. This matches the recommendations with sample sizes for exploratory research (McCracken, 1988, p.17). The interviewees were chosen by internal experts to represent a variety of experienced perspectives. As our aim was to investigate supplier-related behavioral barriers, our interviews focused on sales and key account managers who most frequently engaged in negotiations with customers, where they had the opportunity to set (and if successful, to get) value-based prices. From the customer side, we interviewed managers from companies that the case company indicated open and interested to value based-pricing; some of them had already accepted value-based pricing logics, while others were still considering them.

The interviews lasted, on average, more than an hour and consisted of open-ended questions to capture insights from a broader perspective (Silverman, 2012). All the interviews were recorded and subsequently transcribed. An overview of the sample characteristics is shown in Table 1.

Table 1
Interviewee information.

Company	Role	Date	Length
MetalComp	Sales unit managing director	7.4.2014	69 min
	Sales executive	15.4.2014	99 min
	Account manager	2.4.2014	55 min
	Product manager	3.4.2014	74 min
	Account manager	4.4.2014	58 min
	Key account manager	7.4.2014	59 min
	Key account manager	8.4.2014	74 min
	Product manager	9.4.2014	77 min
	Manager	10.4.2014	69 min
	Key account manager	10.4.2014	82 min
	Manager	11.4.2014	68 min
	Key account manager	14.4.2014	57 min
	Product manager	14.4.2014	73 min
	Key account manager	15.4.2014	73 min
	Manager	15.4.2014	56 min
	Manager	16.4.2014	79 min
	Manager	22.4.2014	52 min
	Manager	22.4.2014	78 min
	Manager	22.4.2014	59 min
	Key account manager	23.4.2014	68 min
Metal industry, customer	Production manager	22.5.2014	50 min
Paper industry, customer	Production director	22.5.2014	45 min
	Sourcing manager	18.6.2014	41 min
Paper industry technology and service provider, customer	Director	11.6.2014	44 min
Total	24 interviews		25 h 59 min

3.3. Data analysis

Our data analysis followed an abductive process, where the understanding of the phenomenon based on the literature laid the foundation for early interviews, which then used evolving themes to track important issues as the interviews progressed and our understanding of value-based pricing in the real-life setting increased (Dubois & Gadde, 2014). In practice, prior literature informed us about the organizational barriers to value-based pricing (c.f., Töytäri et al., 2015), and the interviews explored how these or other emerging barriers manifested at the individual level. While prior literature guided the analysis, we did not employ preconceived codes, but relied on open coding, which used in-vivo labeling, and described the emerging concepts based on the actual language used by informants (Corbin & Strauss, 2015). Specifically, we coded both tangible activities and practices, as well as more intangible beliefs, assumptions, and attitudes that were considered to hinder value-based pricing, in order to be as inclusive as possible in gaining a rich understanding of the topic.

In line with Gummesson (2000), our data analysis began from the early observations, which enabled us to structure our data into consistent blocks reflecting the emerging patterns in the data. This led to the emergence of three categories – individually, organizationally, and externally induced barriers – that describe the main sources of the assumptions and behaviors that may prevent value-based pricing. During the process we constantly revised our preliminary theory-based ideas of meaningful categories of data with empirically grounded insights of the barriers that impeded the adoption of value-based pricing logic in the case. We organized the data by using open and axial coding, and converting it to discrete thematic blocks that described the different types of barriers that the interviewed individuals experienced, the characteristics of each barrier, and the potential sense-making practices that managers used to overcome those barriers (Corbin & Strauss, 2015).

The analysis progressed through a highly iterative process, where the emerging findings were constantly reflected and revised between and within the research team and the informants at the case company. The research team held several interim meetings and consulted external co-researchers to interpret the empirical observations, and several managers from the case company audited the preliminary results and provided feedback as the research continued. The frequent exposition of emergent results to both managerial (deep and local, context-specific knowledge) and academic (broad knowledge from several contexts) audiences ensured that we had reached sufficient understanding of the research phenomenon – individual barriers of value-based pricing – and captured the breadth and depth of how managers experienced it in their own social reality in our case organization (Gioia, 2003; Järvensivu & Törnroos, 2010).

Because qualitative case research is sensitive to researchers' subjective interpretations, we used a variety of tactics to improve the quality of the research and the trustworthiness of the findings (Beverland & Lindgreen, 2010; Eisenhardt & Graebner, 2007; Lincoln & Guba, 2000) First, we used *theoretical sampling* and *revelatory case logics* to identify and gain access to empirical data that would provide theoretically and contextually rich insights in terms of the focal phenomenon, in this case, value-based pricing. Second, we applied several forms of *triangulation* (theory, researcher, and data) to increase the credibility and validity of the study. In practice, we combined several well-established theories as our analytical lenses (see conceptual background), used multiple researchers and external experts as co-interpreters, and drew empirical insights from several key informants, and different sources of data. Third, we conducted frequent *member checks* and *peer debriefing* to reduce researcher bias and increase the objectivity of the study. Finally, by providing a rich set of direct interview quotations to demonstrate interpretations, we support the transparency and conformability of the findings.

4. Empirical findings

The findings from this study suggest that the individuals in our case company face eleven barriers to the implementation of the value-based pricing, falling into three distinct and adjacent groups: individually, organizationally, and externally induced (Table 2). Further, we identified sensegiving strategies that managers in the case company apply to overcome those barriers. In the following, we describe and analyse the barriers, and the corresponding sense-giving strategies with illustrative quotations from the interview data.

4.1. Individually induced barriers

Individually induced barriers are the assumptions and behaviors that prevail in an individual manager's cognitive processes, and impede his or her ability to exercise value-based pricing. In our dataset, the individual barriers were related to beliefs and attitudes, experience and skills (or lack thereof), and the high cost and complexity of value quantification.

4.1.1. Beliefs and attitudes

Beliefs and mental attitudes are important cognitive components that affect an individual's confidence to perform a given task (Bandura, 1997), and prior research has suggested that confidence plays a key role in setting and realizing value-based prices (Hinterhuber & Liozu, 2012). However, many informants in our sample had deeply rooted beliefs about their inability to realize value-based prices or sell service-intensive offerings, which tend to emphasize added value instead of the lowest price. Furthermore, some informants conveyed a dismissive attitude towards the importance of value-based pricing and saw it more as a temporary management fad than an important or dominant logic, in which they should invest time and resources.

> "I'm very clumsy as a value and service seller. I do not consider myself as a service seller." (Account Manager)

> "This [value-based approach] is now the latest trend…We should be looking for the next trend." (Manager)

4.1.2. Experience and skills

Several informants in our sample explained that although they were experienced and skillful salesmen, they were used to sell high-quality components that were priced based on product features and superior technology. Many believed that it would require serious re-training, the acquisition off new skills, and a deep change in a prevailing mindset to change their frame of reference, and to start pricing products based on potential value instead of perceived features or technological attributes.

Table 2
Barriers to value-based pricing.

Individually induced barriers	Organizationally induced barriers	Externally induced barriers
Beliefs and attitudes	Product-oriented sales culture	Prevailing buying culture
Experience and skills	Governance and tools	Incompatible value conceptions
High cost and complexity of value quantification	Inefficient customer selection	Supplier's brand identity
		Incompatible time horizons
		Value sharing power within the network

> "If you have been doing it [selling products] twenty years and it has worked somehow, it's very hard to change it, even if you would like to." (Manager)

> "Maybe the change is also in between the ears, that we would sell something else than the traditional [products] that you know like the back of your hand. And would be brave to go and talk about something else [like value to the customer]." (Manager)

> "A salesperson who is an experienced product seller does not necessarily see the possibilities that we could offer for the customer." (Manager)

4.1.3. High cost and complexity of value quantification

Some informants pointed out, that even though they were willing and able to exercise value-based pricing, it was often just too difficult or costly to quantify the potential value to the customer. Personal time and energy required, difficult or no access to customer data, and the complexity of calculating the potential performance impact were often mentioned as the reasons which made value quantification a costly exercise, which was often not justified by the offering margin or estimated relationship value.

> "If you have ten tenders to do, and you have done one good tender that you know is ok, are you going to add the value quantification for the one or are you going to do those ten tenders that are waiting… I haven't had any case that would have changed the game for me, if you consider the time and effort." (Manager)

4.1.4. Sensegiving strategies

To counter the individually induced barriers, MetalComp uses three sensegiving strategies. First, the firm launched internal programs that documented the value created in individual customer cases, and visibly promotes the results inside the company to instil confidence and motivate personnel. Second, they provide value-focused training programs that teach individual managers new skills and sales arguments, and help them to change their frame of references from product features to value realized. Finally, they developed an advanced value assessment tool (proprietary and interactive software) that helps individual managers to quickly calculate the potential value when negotiating with the customer.

4.2. Organizationally induced barriers

Organizationally induced barriers are the assumptions and behaviors that prevail within a broader organizational culture, climate, and practices, and impede the individual manager's capability to exercise value-based pricing. In our data set, the organizational barriers were related to product-oriented sales culture, governance and tools, and lack of customer segmentation.

4.2.1. Product-oriented sales culture

An organizational culture reflects the shared meanings and norms that guide the daily behavior of its members (Alvesson, 2011). The organizational climate is the perceived atmosphere in the organization that is created by practices, procedures, and rewards (Schneider, Gunnarson, & Niles-Jolly, 1994). Both the organizational culture and climate can be critical hurdles in transitioning from traditional cost- or product-driven sales culture towards a more value-driven culture (Ulaga & Loveland, 2014). MetalComp has a long and successful history as a quality component supplier, which competes in mature and commoditized product business. This heritage has a strong influence on the organization's product-oriented sales culture, which is often associated with

aggressive short-term profit maximization. Consequently, many of our informants identified themselves largely as component suppliers, and believed in cost-based pricing logic.

"We all [salespeople] are hired to sell products not services." (Account Manager)

"There is that mentality that we do not ask money for the training or services since they are part of our products." (Manager)

4.2.2. Governance and tools

In addition to influencing the identity of individual managers, the product-oriented sales culture shaped the case company's organizational processes and systems. MetalComp's organizational structure, business model, sales management and IT systems as well as incentive policies were designed to support the traditional, customer-demand driven product business. However, many informants emphasized that the organizational processes and systems that worked with product-based logic, did not work as well with value-based logic, which requires fundamentally different sales and incentive models.

"It's challenging [to sell and price value] in the product-oriented company where all the processes and systems support product-orientation." (Account Manager)

"I'm not a service seller, it's not the way how I'm measured and it's not my first priority … our targets and looks are directed to components and products still." (Manager)

"We are still first and foremost a component supplier and all the systems, logistics, sales channels are designed for this." (Manager)

4.2.3. Inefficient customer selection

Strategic customer segmentation helps firms to understand their customers and to allocate scarce resources, and is essential to identify customers who are open to long-term, value-oriented relationships (Terho, Eggert, Haas, & Ulaga, 2015). However, MetalComp's customer selection logic is based on a reactive, product-based culture, featuring inefficient customer segmentation, lack of consideration regarding differing customer situations, and inadequate sales opportunity qualification. Many informants underlined that the lack of proper customer selection guidelines made it difficult to identify high potential customers who would be more likely to engage in or accept value-based pricing.

"We sell to anyone who is willing to buy." (Manager)

"Too often we go to the customer meetings with our old slide sets without really considering what the customer's current business topics are." (Key account manager)

"When only the cheapest is cheap enough and when the customer does not know about its future, it is quite difficult to sell long-term value." (Manager)

4.2.4. Sensegiving strategies

To counter the organizationally induced barriers, the MetalComp uses three sensegiving strategies. First, it established a central global office and local champions to promote and develop value-based culture within the company, and instil value-based logic as a new dominant logic in its marketing, sales, and customer relationships. Second, the firm made structural and managerial changes (new organizational structures, metrics, roles and meetings routines), and updated its IT systems to support value-based pricing by providing customer intelligence, preparing contract templates, and offering legal advice. Finally, they started to invest in customer value research and identifying customers in advance who are likely to be more likely receptive to and benefit from the value-based pricing.

4.3. Externally induced barriers

Externally induced barriers consist of the assumptions and behaviors that prevail in the interactions within a firm's customer relationships and networks that impede the individual manager's capability to exercise value-based pricing. In our data set, the external barriers were related to the buying culture, incompatible value conceptions, the supplier's brand identity, incompatible time horizons, and value-sharing power within the network.

4.3.1. Prevailing buying culture

The prevailing buying culture is usually unprepared to holistically evaluate the business impact or use value of offerings. Instead, industrial buyers set minimum requirements for acceptable solutions, short-list a selection of qualifying vendors, and exercise their bargaining power for lowest price. To influence a buyer's value perceptions, sellers need to engage with their customers' buying processes in the early stages, while the customers are evaluating their situations and needs. However, this early influence is demanding, as industrial companies generally have limited understanding of what their customers value:

"You need to know your customer better than the customer knows itself." (Key Account Manager)

A key reason is the mature, commoditized, and productized industrial exchange. Industrial sellers tend to engage late in their customers' buying processes, after customers have determined their reasons to buy, their solution vision, and evaluation criteria. The customers share very little of their business challenges with the suppliers during the search and selection stages of the industrial buying. Suppliers have very few opportunities, motivation, and even reasons to learn from their customers during competitive bidding processes. Customers' business processes, drivers and challenges remain unknown.

4.3.2. Incompatible value conceptions

The prevailing industrial buying culture is shaped by repetitive and competitive selection from comparable alternatives. Buyers' requirements specification and evaluation of alternatives are usually guided by their perception of what is important and deserves attention in their decision-making situation. Many informants explained that it was usually difficult to persuade customers to pay for benefits that were not included in the buyer's evaluation process and pre-determined evaluation criteria.

"Services were considered as free part of the products and they were included if you buy the product. Now it is hard to change 100-year-old traditions and to start asking for money if you move your pencil in terms of service selling." (Account Manager)

"Customer reaction is positive but at the end of the day they are not willing to pay for soft values such as environment." (Key account manager)

"The main buying criteria are total price that includes unit price, logistics and quality." (Sourcing Manager, customer)

Buyers' value conception (Rajala et al., 2015) meaning the dimensions of value that are recognized and considered important in decision-making, is often very narrow, focusing only on a few salient sources to create value. In extreme cases, only the price matters.

4.3.3. Supplier's brand identity

Brand identity communicates the supplier's unique way of delivering value to its customers, and influences customers' expectations, and sometimes even their requirements (Jalkala & Keränen, 2014; Keller, 2003). MetalComp's customers often view and position the case company as a non-strategic commodity component supplier in their supply chain management model. Influencing prevailing perceptions requires access to influential stakeholders. This access requires relationship maturity and a sufficiently strategic relationship. Hence, regardless of the case company's motivation and readiness to promote value-based message, some customers may deny them the opportunity to do so:

> "Basic components such as the [case company's] products"… "It works there two years as it should. Next time we can install a product from another supplier and it will do the same. So how can you see the added value or the difference? It is really difficult." (Production Manager, customer)

> "Of course we want to move from the left lower corner, a component supplier, to the right upper corner, a solution supplier… For solution providers communication is open and you can see the big picture. Sometimes we can solve problems that the customer did not even know to ask. But getting there is really challenging." (Key account manager)

4.3.4. Incompatible time horizons

The prevailing buying culture is often incentivized for short-term gains. Value-related gains are typically realized over longer periods of time, and often exceed industrial buyer's decision-making horizon:

> "Many customers want payback time that is less than a year." (Sales Executive)

> "When only the cheapest is cheap enough and when the customer does not know about its future, it is quite difficult to sell long-term value." (Manager)

4.3.5. Value sharing power within the network

Several informants explained that their attempts to communicate and price value are often unsuccessful, because their customers cannot extend the value-based logic to their customers and ultimately to the downstream stages of the industrial value chain:

> "Some customers do not speak about value to their customers and there is no pull effect. There is only a push effect as only we salespeople speak about it." (Key Account Manager)

This statement illustrates the prevailing industrial logic. Many informants pointed out that the original equipment manufacturers did not buy value if they could not sell it to their customers. Hence, if the institutionalized rules and routines ignore the improvement potential provided by the value-based evaluation of offerings, the vendors following a different logic suffer. Ultimately, this barrier is about whether the entire industrial value-chain is capable of capturing a fair share (higher than cost-based) of the value created by the value chain. The (higher) value captured is then distributed across the value chain following the value-based pricing logic.

4.3.6. Sensegiving strategies

To counter the externally induced barriers, the MetalComp uses the following sensegiving strategies. First, they have established a global office to speak at industry events, arrange seminars, write whitepapers and books, and produce benchmarking studies and substantiated reference stories.The entire organization has an incentive to produce and share success stories of value created. These actions help build a value provider brand, gradually change the brand image of MetalComp, and create receptivity among key customer stakeholders. Second, MetalComp seeks to influence the buying culture by engaging in customer value research and value proposition development, and builds the capabilities, practices, and tools to support value proposition quantification jointly with customers. These actions likely influence and expand their customers value conception by identifying improvement opportunities in their customers' business processes, formulate the findings as value propositions, quantify and verify value created post-implementation, create success stories documenting that value created, and share those success stories with their new prospective customers. The sensegiving strategies facilitate access to influential stakeholders, re-position MetalComp within the customer's supplier management model as a more strategic partner, and shift the focus from short-term gains to longer-term evaluation of value. The case company informants also identified changing the prevailing social structures by hiring employees with different backgrounds and utilizing cross-functional teams as effective sensemaking strategies.

5. Discussion and conclusions

As product commoditization and short-term cost orientation have made competition in industrial markets highly difficult, industrial firms are increasingly interested in implementing value-based pricing strategies. However, at the moment, most of the advice and insight on this transition in the literature is focused on organizational decision making (i.e., why or how organizations set and get value-based prices), but provides only limited understanding on how individual managers influence the pricing process, or what prevents them from setting and getting value-based prices. Consequently, scholars have placed several calls to increase research in this area (Hinterhuber and Liozu, 2017; Lancioni et al., 2005)

In response to these calls, we have adopted a micro-foundations perspective, and explored what barriers individuals in organizations face that may impede the implementation of value-based pricing logic at the organizational level. We suggest, that this is an important addition to the literature, which tends to usually assume (explicitly or implicitly) that pricing decisions are made or pricing strategies are enacted by organizations. However, all organizational activities that manifest as routines and processes, including pricing strategies and practices, "do not rest upon invariable social laws, but upon the stability of the beliefs and expectations of the actors involved" (Tsoukas & Knudsen, 2005, p.15). In other words, individual actors drive selected organizational, or in this case, pricing, activities.

This study identified three categories of barriers – individually, organizationally, and externally induced – that may interfere with an individual manager's ability to exercise value-based pricing. These barriers originate from different sources, and affect sensemaking. Externally induced barriers arise from "external realm", from industry norms and beliefs, and from an established way of managing customer relationships. These barriers also influence the organizationally induced barriers, which reflect the prevailing organizational culture. Further, both the externally and organizationally induced barriers influence the individually induced barriers, which reflect innate beliefs and values. These barriers exist at different interfaces (Fig. 1), and occur as assumptions and behaviors by different actors that (may) prevent individual pricing

activities of becoming more permanent organizational routines and processes, and more broadly, a new, value-based institutional logic. In the following, we outline the implications for theory and managerial practice.

We found that individual managers play a key role in the process of legitimizing VBP in inter-organizational exchange. Hence, sensemaking by individuals related with the opportunities and perceived barriers to VBP can be seen a key to successfully influencing of the sensemaking of other actors in the transformation toward a redefinition of the used schemas of reasoning for pricing decisions. In this regard, individual actors process, interpret, and act on information based on their previous experiences, knowledge, preferences, and personal goals (i.e. their adopted institutional logic), and respond in ways that they believe are legitimate (c.f., Suchman, 1995, p.574). As the individuals interact with other actors, exchanging world-views, negotiating and building shared understandings, their perceptions slowly spread through the organizations. If world-views and beliefs are sufficiently shared, those beliefs become observable as the rationale for the organization's behavior, and may be accepted as a new dominant institutional logic. The right side of the Fig. 1. Illustrates this sensegiving process to legitimize the VBP, extending from the individual realm to the organizational realm and further to the external realm.

5.1. Theoretical implications

The findings from this study make a several specific contributions. First, previous literature has considered pricing as an organization-level phenomenon, and consequently, explored what organizational practices, strategies, and barriers influence the adoption of different pricing logics (Hinterhuber, 2008; Hinterhuber & Liozu, 2012; Ingenbleek & van der Lans, 2013; Töytäri et al., 2015). This study extends this stream of literature by adopting a microfoundations perspective (Abell et al., 2008; Teece, 2007), and exploring how the barriers experienced and perceived at an individual level may influence the adoption of value-based pricing logics and more generally also the organizational change toward value-based exchange.

Second, prior literature has highlighted the importance of organizational or collective confidence as a key driver of value-based pricing, and described the factors that may increase confidence and create "pricing superheroes" inside the organization (Liozu et al., 2012). This study takes the opposite approach, and sheds light on the factors that may decrease collective confidence on pricing, and thus hinder the adoption of value-based pricing. More specifically, our findings identify three types of barriers (individually, organizationally, and externally induced) that create resistance and friction to value-based pricing, and are likely to influence negatively on collective confidence on pricing.

Third, recent research on the domain of institutional theory has explored how dominant institutional logics influence and shape market behavior, and how emerging logics may come to life (Besharov & Smith, 2014; Ertimur & Coskuner-Balli, 2015; Thornton et al., 2012). This is especially relevant in industrial markets, where value-based pricing logic would likely benefit several actors in the long-term, but cost-based pricing logics often tend to prevail as the dominant pricing logics (Hinterhuber & Liozu, 2012; Terho et al., 2012). However, the literature provides only limited understanding on how individual actors make sense of different logics, and more research is needed on "understanding how micro-level actors interpret and work through the meaning of competing logics" (Reay & Hinings, 2009, p.632). To this end, the findings from this study illustrate why individual managers may resist adopting a value-based pricing logic, and how organizations can counter by deploying different sense-giving strategies that influence individual interpretations and perceptions about legitimate business logics.

Finally, prior research has identified different communication strategies, including value visualization and value representation, that can motivate external stakeholders to adopt more value-oriented business logics (e.g., Corsaro, 2014; Kindström, Kowalkowski, & Nordin, 2012). The findings from this study complement this research by illuminating alternative sense-giving strategies that can motivate internal stakeholders to adopt value-based pricing logics.

5.2. Managerial implications

This study offers several managerial implications. First, it underscores that the transition from cost- to value-based based pricing logic is neither easy nor straightforward, not even for industry leaders, who may have a dominant market position or technological superiority over competitors. Several managers in our study underlined that a competitive advantage as a high quality product supplier does not automatically translate into value-based pricing. In contrast, if a company has positioned itself as a strong and successful product supplier in the minds of its employees and customers, it may be more difficult to change the prevailing beliefs and assumptions about socially agreed-upon and expected pricing logics.

Second, managers need to understand that many of the barriers are inherently institutional, including mental beliefs of what is possible, worthwhile, or even socially acceptable. As such, they may require substantial investments in long-term change management, training programs, and championing behavior, instead of short-term investments into information systems, analytic tools, and pricing methods. This often requires also a strong commitment from senior or "C-suite" managers to mobilize resources, as social barriers may be highly resistant to change.

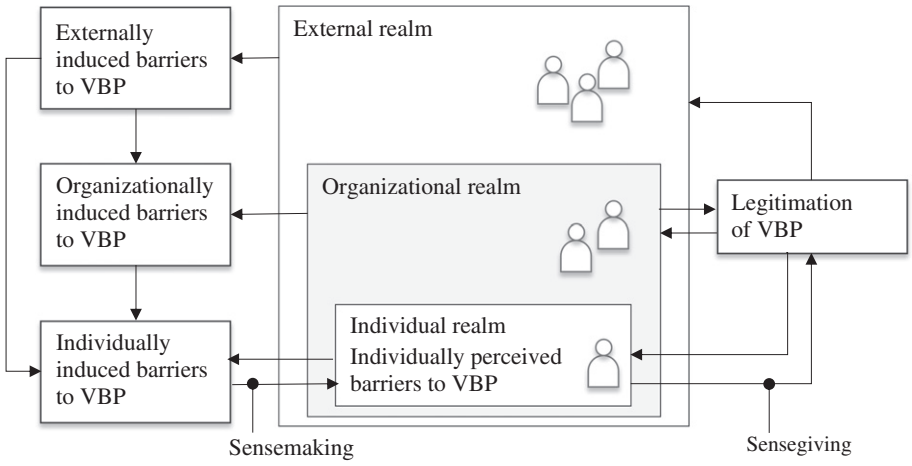


Fig. 1. Individually perceived barriers to VBP and the legitimation of VBP.

Table 3
Managerial sensegiving strategies to legitimate VBP.

Individually induced barriers	Organizationally induced barriers	Externally induced barriers
Internal programs to document and communicate value created for individual customers. Value-focus training programs. Value assessment software tools to support sales meetings.	Central global office and local champions to promote value-based culture. Changes in governance structure, incentives, performance metrics, roles, and meeting routines. Value research activities to systematically gain customer insight. Tools, templates, and information to support application of VBP.	Global office to speak at industry events, arrange seminars, produce benchmarking studies, substantiated reference stories, books, and whitepapers. Value research, value proposition development, sharing of success stories with customers, and value quantification jointly with customers to change the industry buying culture and relationship logic.

Third, this study illustrates potential sensegiving strategies that managers can use to overcome the identified barriers, and legitimize value-based pricing inside their organizations and with key stakeholders. However, as the high cost of value quantification can make value-based pricing unprofitable in some cases, managers must carefully identify and select how and when they deploy sensegiving strategies. Managers who work with complex and service-intensive offerings with high value creation potential are likely to adopt value-based pricing logic easier than those who work with standardised products. The identified sensegiving strategies are summarized in Table 3.

5.3. Limitations and future research directions

As this research is based on an exploratory single case study, it has some limitations, which also offer future research opportunities. First, we explored barriers only in one case firm. Further research could investigate several firms in different industries to reveal other kinds of barriers. It is highly likely that firm size, industry, offering type (products, services, solutions) and customer type (short-term/long-term orientation) will influence the barriers encountered. Second, we relied on qualitative interview data. Further research could employ quantitative studies, develop scales for the barriers of value-based pricing, and explore how different barriers impact performance outcomes at the individual salespeople, customer relationship, and company levels.

Third, we adopted supplier's perspective, and explored the barriers that affect individual managers' capability to exercise value-based pricing in the supplier organization. Future research could adopt a customer perspective, and explore the customers' behavioral barriers to value-based pricing. In other words, why and how do customers resist value-based pricing? This would be an important research topic, considering that value-based pricing is likely to result in higher initial prices, but also higher value outcomes in the long-term. Future research could investigate whether customers resist unintentionally or on purpose. Does their resistance originate from the individual customer manager or from the organization? From a broader perspective, most research tends to address pricing from the supplier's perspective, while customer's perspective remains woefully under-researched. This represents a significant opportunity for the future pricing research.

Acknowledgements

This research was conducted in the Future Industrial Services (2470/31/2010) and Service Solutions for Fleet Management (2634/31/2014) research programs, managed by the Finnish Metals and Engineering Competence Cluster, and funded by the Finnish Funding Agency for Technology and Innovation, research institutes and companies. Their support is gratefully acknowledged.

References

Abell, P., Felin, T., & Foss, N. (2008). Building micro-foundations for the routines, capabilities, and performance links. *Managerial and Decision Economics*, *29*(6), 489–502. http://dx.doi.org/10.1002/mde.1413.

Alvesson, M. (2011). Organizational culture: Meaning, discourse, and identity. In N. M. Ashkanasy, C. P. M. Wilderom, & M. F. Peterson (Eds.), *Organizational culture and climate* (pp. 11–28). Los Angeles: Sage Publications.

Anderson, J. C., & Wynstra, F. (2010). Purchasing Higher-Value, Higher-Price Offerings in Business Markets. *Journal of Business-to-Business Marketing*, *17*(1), 29–61. http://dx.doi.org/10.1080/10517120903000363.

Anderson, J. C., Narus, J. A., & van Rossum, W. (2006). Customer value propositions in business markets. *Harvard Business Review*, *84*(3), 1–10.

Anderson, J. C., Wouters, M., & van Rossum, W. (2010). Why the Highest Price Isn't the Best Price? *MIT Sloan Management Review, (Winter 2010)* (pp. 69–78).

Anderson, J. C., Narus, J. A., & Wouters, M. (2014). Tiebreaker selling. *Harvard Business Review, (MARCH)*.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, *17*, 99–120. http://dx.doi.org/10.1177/014920639101700108.

Besharov, M. L., & Smith, W. K. (2014). Multiple institutional logics in organizations: Explaining their varied nature and implications. *Academy of Management Review*, *39*(3), 364–381. http://dx.doi.org/10.5465/amr.2011.0431.

Beverland, M., & Lindgreen, A. (2010). What makes a good case study? A positivist review of qualitative case research published in Industrial Marketing Management, 1971–2006. *Industrial Marketing Management*, *39*(1), 56–63. http://dx.doi.org/10.1016/j.indmarman.2008.09.005.

Corbin, J., & Strauss, A. L. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (4th Editio.). Newbury Park, CA: Sage Publications.

Corsaro, D. (2014). The emergent role of value representation in managing business relationships. *Industrial Marketing Management*, *43*(6), 985–995. http://dx.doi.org/10.1016/j.indmarman.2014.05.011.

Creswell, J. W. (2013). *Qualitative inquiry & research design* (3rd ed.). Thousand Oaks: Sage Publications.

Dubois, A., & Gadde, L. -E. (2014). "Systematic combining"—A decade later. *Journal of Business Research*, *67*(6), 1277–1284. http://dx.doi.org/10.1016/j.jbusres.2013.03.036.

Dutta, S., Zbaracki, M. J., & Bergen, M. (2003). Pricing process as a capability: A resource-based perspective. *Strategic Management Journal*, *24*(7), 615–630. http://dx.doi.org/10.1002/smj.323.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, *50*(1), 25–32. http://dx.doi.org/10.2307/20159839.

Ertimur, B., & Coskuner-Balli, G. (2015). Navigating the institutional logics of markets: Implications for strategic brand management. *Journal of Marketing*, *79*(March), 40–61.

Felin, T., & Foss, N. J. (2005). Strategic organization: a field in search of micro-foundations. *Strategic Organization*, *3*(4), 441–455. http://dx.doi.org/10.1177/1476127005055796.

Gioia, D. A. (2003). Give it up!: Reflections on the interpreted world (a commentary on Meckler and Baillie). *Journal of Management Inquiry*, *12*(3), 285–292. http://dx.doi.org/10.1177/1056492603257725.

Gioia, D. A., & Chittipeddi, K. (1991). Sensemaking and sensegiving in strategic change initiation. *Strategic Management Journal*, *12*(6), 433–448. http://dx.doi.org/10.1002/smj.4250120604.

Gioia, D. A., & Thomas, J. B. (1996). Identity, image, and issue interpretation: Sensemaking during strategic change in academia. *Administrative Science Quarterly*, *41*, 370–403. http://dx.doi.org/10.2307/2393936.

Gummesson, E. (2000). *Qualitative methods in management research* (2nd Editio.). Thousand Oaks: Sage Publications.

Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D., & Winter, S. G. (2009). *Dynamic capabilities: Understanding strategic change in organizations*. John Wiley & Sons.

Hinterhuber, A. (2008). Customer value-based pricing strategies: Why companies resist. *Journal of Business Strategy*, *29*(4), 41–50. http://dx.doi.org/10.1108/02756660810887079.

Hinterhuber, A., & Liozu, S. M. (2012). Is it time to rethink your pricing strategy? *MIT Sloan Management Review*, *53*(4), 68–77.

Hinterhuber, A., & Liozu, S. M. (2017). The micro-foundations of pricing. *Journal of Business Research*, *76*, 159–162.

Hodgson, G. M. (2012). The mirage of microfoundations. *Journal of Management Studies*, *49*(8), 1389–1394. http://dx.doi.org/10.1111/j.1467-6486.2012.01079.x.

Ingenbleek, P. T. M., & van der Lans, I. A. (2013). Relating price strategies and price-setting practices. *European Journal of Marketing*, *47*(1), 27–48. http://dx.doi.org/10.1108/03090561311285448.

Jalkala, A. M., & Keränen, J. (2014). Brand positioning strategies for industrial firms providing customer solutions. *Journal of Business & Industrial Marketing*, *29*(3), 253–264. http://dx.doi.org/10.1108/JBIM-10-2011-0138.

Järvensivu, T., & Törnroos, J.-Å. (2010). Case study research with moderate constructionism: Conceptualization and practical illustration. *Industrial Marketing Management*, *39*(1), 100–108. http://dx.doi.org/10.1016/j.indmarman.2008.05.005.

Johansson, M., Keränen, J., Hinterhuber, A., Liozu, S., & Andersson, L. (2015). Value assessment and pricing capabilities—How to profit from value. *Journal of Revenue and Pricing Management*.

Keller, K. L. (2003). *Strategic brand management: building, measuring and managing brand equity (2nd editio.)*. New Jersey: Prentice Hall.

Keränen, J., & Jalkala, A. (2014). Three strategies for customer value assessment in business markets. *Management Decision*, *52*(1), 79–100. http://dx.doi.org/10.1108/MD-04-2013-0230.

Kindström, D., Kowalkowski, C., & Nordin, F. (2012). Visualizing the value of service-based offerings: empirical findings from the manufacturing industry. *Journal of Business & …*, *27*(7), 538–546. http://dx.doi.org/10.1108/08858621211257301.

Kortge, G. D., & Okonkwo, P. A. (1993). Perceived value approach to pricing. *Industrial Marketing Management*, *22*(2), 133–140.

Lancioni, R., Schau, H. J., & Smith, M. F. (2005). Intraorganizational influences on business-to-business pricing strategies: A political economy perspective. *Industrial Marketing Management*, *34*(2 SPEC. ISS), 123–131. http://dx.doi.org/10.1016/j.indmarman.2004.07.010.

Lincoln, Y., & Guba, E. (2000). Paradigmatic controversies, contradictions, and emerging confluences. *Handbook of qualitative research*.

Liozu, S. M., & Hinterhuber, A. (2013). Pricing orientation, pricing capabilities, and firm performance. *Management Decision*, *51*(3), 594–614. http://dx.doi.org/10.1108/00251741311309670.

Liozu, S. M., Hinterhuber, A., Boland, R., & Perelli, S. (2012). The conceptualization of value-based pricing in industrial firms. *Journal of Revenue and Pricing Management*, *11*(1), 12–34. http://dx.doi.org/10.1057/rpm.2011.34.

Maitlis, S. (2005). The social processes of sensemaking. *Academy of Management Journal*, *48*(1), 21–49.

Maitlis, S., & Lawrence, T. B. (2007). Triggers and enablers of sensegiving in organizations. *Academy of Management Journal*, *50*(1), 57–84.

McCracken (1988). *The long interview (4th editio.)*. Newbury Park, CA: Sage Publications.

Nelson, R. R., & Winter, S. G. (1982). *An evolutionary theory of economic change*. Cambridge: Belknap.

Nenonen, S., & Storbacka, K. (2010). Business model design: conceptualizing networked value co-creation. *International Journal of Quality and Service Sciences*, *2*(1), 43–59. http://dx.doi.org/10.1108/17566691011026595.

Powell, T. C., Lovallo, D. A. N., & Fox, C. R. (2011). Behavioral strategy. *Strategic Management Journal*, *32*, 1369–1386. http://dx.doi.org/10.1002/smj.

Rajala, R., Töytäri, P., & Hervonen, T. (2015). Assessing customer-perceived value in industrial service systems. *Service Science*, *7*(3), 210–226. http://dx.doi.org/10.1287/serv.2015.0108.

Reay, T., & Hinings, C. R. (2009). *Managing the rivalry of competing institutional logics*. Organization Studies. http://dx.doi.org/10.1177/0170840609104803.

Schneider, B., Gunnarson, S. K., & Niles-Jolly, K. (1994). Creating the climate and culture of success. *Organizational Dynamics*, *23*(1), 17–29.

Silverman, D. (2012). *Interpreting qualitative data: Methods for analyzing talk, text and interaction*. London: Sage Publications.

Steiner, M., Eggert, A., Ulaga, W., & Backhaus, K. (2014). *Do customized service packages impede value capture in industrial markets? Journal of the Academy of Marketing Science, 1–15. http://dx.doi.org/10.1007/s11747-014-0410-9*.

Suchman, M. C. (1995). Managing legitimacy: Strategies and institutional approaches. *The Academy of Management Review*, *20*(3), 571. http://dx.doi.org/10.2307/258788.

Suddaby, R., Elsbach, K. D., Greenwood, R., Meyer, J. W., & Zilber, T. B. (2010). Organizations and their institutional environments — Bringing meaning, values, and culture back in: introduction to the special research forum. *Academy of Management Journal*, *53*(6), 1234–1240. http://dx.doi.org/10.2139/ssrn.2266086.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, *28*, 1319–1350.

Teece, D. J., Pisano, G., Shuen, A. M. Y., & Wiley, J. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18*(7), 509–533. http://dx.doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z.

Terho, H., Haas, A., Eggert, A., & Ulaga, W. (2012). "It's almost like taking the sales out of selling"—Towards a conceptualization of value-based selling in business markets. *Industrial Marketing Management*, *41*(1), 174–185. http://dx.doi.org/10.1016/j.indmarman.2011.11.011.

Terho, H., Eggert, A., Haas, A., & Ulaga, W. (2015). How sales strategy translates into performance: The role of salesperson customer orientation and value-based selling. *Industrial Marketing Management*, *45*, 12–21. http://dx.doi.org/10.1016/j.indmarman.2015.02.017.

Thornton, P. H., Ocasio, W., & Lounsbury, M. (2012). *The institutional logics perspective: A new approach to culture, structure, and process*. Oxford, UK: Oxford University Press.

Townley, B. (2002). The role of competing rationalities in institutional change. *Academy of Management Journal*, *45*(1), 163–179. http://dx.doi.org/10.2307/3069290.

Töytäri, P., & Rajala, R. (2015). Value-based selling: An organizational capability perspective. *Industrial Marketing Management*, *45*, 101–112.

Töytäri, P., Rajala, R., & Brashear Alejandro, T. (2015). Organizational and institutional barriers to value-based pricing in industrial relationships. *Industrial Marketing Management*, *47*, 53–64.

Tsoukas, H., & Knudsen, C. (2005). Introduction: The need for meta-theoretical reflection in organization theory. *The oxford handbook of organization theory*. Oxford Handbooks Online.

Ulaga, W., & Loveland, J. M. (2014). Transitioning from product to service-led growth in manufacturing firms: Emergent challenges in selecting and managing the industrial sales force. *Industrial Marketing Management*, *43*(1), 113–125. http://dx.doi.org/10.1016/j.indmarman.2013.08.006.

Winter, S. G. (2003). Understanding dynamic capabilities. *Strategic Management Journal*, *24*(10), 991–995. http://dx.doi.org/10.1002/smj.318.