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Editorial — Behavioral and psychological aspects of b2b pricing

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ABSTRACT

In this paper we define core research questions falling within the domain of behavioral and psychological aspects of B2B pricing. We then present the papers accepted for this special issue. Central research questions are, in our view, all those instances where decisions about price violate basic principles of rational choice. Decisions about price involve two main actors. First is the customer. We are interested in how customers' purchase decisions in B2B exhibit behavioral patterns that are inconsistent with rational choice models. Second is the manager. Managers set prices and in this process are equally susceptible to violating fundamental principles of rational choice. For this special issue we have been able to accept six papers. We welcome the debate that these papers are likely to start.

Research on behavioral and psychological aspects of decision making has witnessed a surge in interest. In a recent special issue of the *Strategic Management Journal* (Powell, Lovallo, & Fox, 2011), Levinthal (2011, p. 1517) asks the question "A behavioral approach to strategy—what's the alternative?" Recent developments in finance, organization theory, and marketing have moved behavioral aspects of decision making solidly within mainstream research. The majority of research in this area is conducted in consumer markets—in many instances with student samples—leaving implications for industrial marketing largely unexplored. With this special issue, *Behavioral and Psychological Aspects of B2B Pricing*, we aim to advance our understanding of this emergent field of research and practice.

In total we received over 30 submissions to this special issue. We have been able to accept six papers following the customary *Industrial Marketing Management* review process. In the opening paper "Violations of rational choice principles in pricing decisions" *Andreas Hinterhuber* presents a comprehensive framework on violations of rational choice principles in decisions about prices by customers — i.e. purchase decisions — and by managers — i.e. price setting decisions. The underlying framework of this paper is intended to improve the quality of decisions for both customers and managers in B2B. The next five papers then focus specifically on either the customer or the manager and examine specific behavioral biases and anomalies of this specific actor.

Papers examining biases related to customers and purchase decisions: *Kent B. Monroe*, *Veli-Matti Rikala*, and *Outi Somervuori*, in "Examining the Application of Behavioral Price Research in Business-to-Business Markets," present five behavioral pricing concepts and discuss implications for industrial marketing theory and practice: the concept of reference prices and the price-perceived value model are widely applied in industrial pricing, the price-quality effect receives mixed support, whereas for price threshold and acceptable price ranges further research is needed.

Papers examining biases related to managers and price setting: *Arch Woodside*, in "The General Theory of Behavioral Pricing: Applying Complexity Theory to Explicate Heterogeneity and Achieve High-Predictive Validity," blends cognitive science, complexity theory, economics, marketing, psychology, and pricing practices to develop a context-rich, path-dependent theory of behavioral pricing in industrial markets. The use of multiple information sources, including ethnographic observations for example, to build models with high predictive validity is a very fruitful avenue which deserves more widespread use for pricing research in industrial markets. *Pekka Töytäri*, *Risto Rajala* and *Thomas Brashear*, in "Organizational and Institutional Barriers to Value-Based Pricing in Industrial Relationships," present the results of qualitative research on the implementation of value-based pricing in industrial companies. The authors identify three main behavioral barriers to implementation: (1) understanding and influencing the customer's desired value, (2) quantifying and communicating value in buyer–seller relationships, and (3) challenges in value capture. The authors propose a novel conceptualization of value in business markets and find that successful implementation of value-based pricing requires a broad view of customer value that includes not only operational and

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strategic aspects but also social and symbolic aspects. *Stephan Liozu* in "Pricing Superheroes: How a Confident Sales Team Can Influence Firm Performance," examines the role of sales force confidence in pricing on firm performance. In a quantitative study with sales and account managers, the author identifies several key antecedents of sales force confidence in pricing. In addition, the author suggests that sales force pricing confidence and pricing capabilities directly and positively influence firm performance. This study highlights the critical role of the pricing confidence construct in the field of business-to-business pricing. *Gopalkrishnan Iye*, *Sarah Xiao*, *Arun Sharma*, and *Michael Nicholson*, in "Behavioral Issues in Price Setting in Business-to-Business Marketing: A Framework for Analysis," present an overview of managerial biases in industrial price setting. The organizational context, the environmental context, and individual managerial factors influence price setting. More specifically, these three factors influence how pricing objectives are set, how environmental analysis is performed, which specific pricing methodology managers select and, finally, the initial price point chosen. This framework summarizes current research in a novel way and provides a rich opportunity for further research on managerial biases in industrial price setting.

As the authors across these papers argue, much of what we know about behavioral and psychological aspects of pricing stems from research with individual customers, mostly students. We must note that consumer behavior researchers themselves have since long warned against the use of student samples: "This is not to say that findings based on students are always wrong. It is only to say that findings based on students are always suspect" (Wells, 1993, p. 492). Consumer researchers note that they "should not build universal theories on student-based results" (Wells, 1993, p. 494). In a recent study, researchers compare the results of a simple survey across dozens of similar student populations and find disconcerting differences in terms of scale means, scale variances and structural relationships (Peterson & Merunka, 2014). The researchers conclude: "statistical inferences drawn from convenience samples of business students do not even generalize to a business student population" (Peterson & Merunka, 2014, p. 1040).

The papers in this special issue indeed confirm the substantial differences in survey results between studies conducted with consumers and studies conducted with industrial purchasing managers and industrial consumers. We cite two salient examples: the price-quality effect, postulating that customers use price to infer product quality. This effect is robust in consumer markets, but not in industrial markets: four different studies have been conducted in B2B, with two reporting a strong effect and two finding no effect (Monroe, Rikala, & Somervuori, 2015). Since a perfectly rational customer would probably evaluate price and quality independently, these studies would suggest that violations of rational decision making are more pronounced in consumer markets than in industrial markets. A second example is the flat fee bias, postulating that customers prefer higher, but predictable fees to lower, fluctuating fees (Lambrecht & Skiera, 2006): customers end up paying more, but being happy about it. This effect is, as recent research reminds us, much more pronounced in industrial markets than in consumer markets (Stingel, 2008): the studies in this area thus suggest, by contrast, that violations of rational decision making are more pronounced in industrial markets than in consumer markets. We could go on — but we note: violations of basic principles of rational choice are not necessarily more widespread in consumer markets than in industrial markets. The papers in this special issue illuminate these rational choice anomalies in industrial markets from different viewpoints. More importantly, all papers in this special issue suggest that our understanding of decisions about prices in industrial markets is significantly enhanced if we consider the psychological and behavioral foundations on which human action rests. We welcome the debate which these and other papers on this emerging stream of research are likely to spark.

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Behavioral issues in price setting in business-to-business marketing: A framework for analysis

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ABSTRACT

Business-to-business pricing research has often focused on developing rational and normative frameworks and models for pricing issues, strategies and tactics. However, there has been less attention given to behavioral models that help us understand the realities of pricing and how managers actually set prices. Specifically, there has been less attention given to the various individual and group influences on the price setting process. We apply insights from a steadily increasing body of literature on behavioral decision making to identify some relevant behavioral issues that may affect managerial price setting processes in business-to-business contexts. We conclude with some implications for theory building and practice and an agenda for future research.

Research on pricing in business-to-business markets is sparse, though some recent articles have shed light on various aspects of pricing, including supply chain pricing (Voeth & Herbst, 2006), price planning (Lancioni, 2005b), pricing in international markets (Forman and Hunt 2005), and pricing of integrated solutions (Sharma & Iyer, 2011). In addition, recent research has also called attention to the study of value-based pricing (Hinterhuber, 2004) as well as the need to understand the impacts and influences of key managers (Lancioni, Schau, & Smith, 2005), including the CEO (Liozu & Hinterhuber, 2013), on price setting.

While normative frameworks have been suggested in the past for price setting in business-to-business contexts, research has also suggested that managers take decisions that appear to deviate from what could be considered optimal given the application of these frameworks (Kopalle, Mela, & Marsh, 1999; Liozu, 2013; Urbany, 2001). However, what is "optimal" can only be determined from the idiosyncratic environmental and organizational context of the firm as well as the firm's intended pricing objectives. Moreover, while there is some research in organizational buying behavior that contends that individual managers' interpretations and cognitive processes affect purchasing decisions (Barclay & Bunn, 2006; Wilson, McMurrian, & Woodside, 2001), similar research on pricing in industrial markets is only in its infancy. For example, Lancioni et al. (2005) demonstrate that managers often face internal "roadblocks" from within their organizations in the price setting process. On the other hand, Liozu and Hinterhuber (2013) find from their empirical study that CEO championing of pricing activities actually enhances the firm's pricing capabilities and contributes to better firm performance.

Approaching the field of business-to-business pricing from the perspective of behavioral decision making, which contends that managerial cognitive biases are key sources for deviations from optimal decisions, we attempt to understand the impacts of managerial factors on the price setting process. Our primary objective is to build a case for the study of managerial cognitions that could affect the use and application of normative frameworks of price setting. With this objective in mind, we attempt to make three distinct contributions to the current sparse research in the area of managerial influences on business-to-business pricing. First, we extend insights from behavioral research from various disciplines, including behavioral economics, management and behavioral finance, to understand how behavioral issues may contribute to the price setting process. While most existing research on business-to-business marketing focuses on the customer or the purchasing manager (e.g., Anderson, Thomson, & Wynstra, 2000), we place our attention on the manager in the selling or marketing firm. Second, we offer a preliminary framework that contends that managerial issue identification, cognitive biases and heuristics intervene in the price setting process, specifically in the observed outcomes of normative decision frameworks. Prior literature on price setting has shown that managers often use pricing objectives that may not be appropriate given the

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environmental and organizational context (Carricano, 2014; Griffith & Rust, 1997). Also, managers may rely too much on one method of pricing (e.g., the cost-plus method), while ignoring other methods (Nagle, Hogan, & Zale, 2010). Moreover, they may not view pricing as a dynamic strategy that needs to be altered with response to changing contexts (Monroe & Cox, 2001). Finally, given the paucity of behavioral as well as prescriptive research on price-setting in business-to-business marketing, we offer some implications for theory as well as an agenda for future academic research that would enhance our understanding of how managers set prices. In this context, we also offer suggestions and implications that could result in enhanced managerial decision competence and thus, improvements in the price setting process in business-to-business markets.

The rest of this paper is organized as follows. In the next section, we take stock of current research in business-to-business marketing, in general, and pricing in particular, and call attention to understanding managerial factors that could impact the price setting process. We then selectively review the literature on behavioral decision making from various disciplines and identify some factors that may impact price setting in business-to-business markets. We then offer some implications for theory and practice as well as an agenda for future research.

1. Understanding managers' impacts on the price setting process

Scholars have proposed several rational and normative frameworks for decision making with respect to prices (see, for examples, Morris & Calantone, 1990; Noble & Gruca, 1999; Oxenfeldt, 1973; Tellis, 1986). Such a normative focus is indeed warranted given that pricing is often viewed by managers in tactical rather strategic terms (Dutta, Bergen, Levy, Ritson, & Zbaracki, 2002), and most managers are daunted by the complexities of developing elaborate pricing plans for their products (Lancioni, 2005b). However, at the same time, researchers are aware that most firms do not always make the correct strategic decisions and in the context of pricing, these could have severe financial implications for the firm (Cudahy & Coleman, 2007; Hinterhuber, 2004; Sharma & Iyer, 2011). In fact, a recent survey revealed that 70% of executives do not believe that their firms have clear pricing strategies (Accenture, 2011). Baker, Marn, and Zawada (2010a) suggest that most firms do not invest in pricing infrastructure and for a Global 1200 company, a one-percent improvement in average prices of services and goods could lead to an 8.7% increase in operating profits.

Researchers have also uncovered that managerial price setting suffers from various issues ranging from selection of inappropriate objectives to misunderstandings of the concept of value and how it relates to price (Hinterhuber, 2004; Hogan & Lucke, 2006; Morris & Calantone, 1990). Moreover, significant opportunities are lost given that even marginal increases in prices could yield significantly more profits as compared to other strategic or tactical actions (Hinterhuber, 2004). Apart from a failure to adjust prices to account for changes in industry demand when pricing through a product's lifecycle (Baker, Marn, & Zawada, 2010b), significant concerns arise when companies set prices lower than what the market could pay (Eugster, Kakkar, & Roegner, 2000). This is because low prices contribute to lost opportunity and in markets that are often inelastic, represent errors that do not, even fortuitously, translate into increased sales. Indeed, there is considerable evidence from practice that errors in pricing may have serious consequences for the organization (Baker et al., 2010b; Eugster et al., 2000; Johansson, Krishnamurthy, & Schlissberg, 2003; Krishnamurthy, Johansson, & Schlissberg, 2003).

Research on pricing in business-to-business marketing had been traditionally inspired by approaches within economics. The primary assumptions are that customers (or, purchasing firm's representatives) use a rational calculus in responding to prices and that marketing firms set their prices rationally with a view to cover costs and achieve broader firm-level objectives. The rational behavior hypothesis has largely remained unchallenged, even though the discrepancies between economic theory and pricing practices have been highlighted in the past (e.g., Hall & Hitch, 1939). In fact, most academic approaches to pricing are either descriptive studies of pricing practices or normative frameworks offering prescriptions on rational price-setting behaviors. What is lacking is a cumulative understanding of the price setting practices followed by firms and the factors that contribute to successful practices (Ingenbleek, 2007).

Since buying decisions in business-to-business markets are taken within an organizational context, it made sense to assume that firms behaved rationally to maximize their own firms' objectives and that the individual decision makers' preferences and tastes mattered very little, given the pursuit of organizational objectives. Similarly, normative models for developing pricing in the business-to-business marketing context are motivated by the premise that marketing firms set their prices rationally with respect to some clear and coherent objectives and after due analysis of the context and circumstances.

Thus, pricing research in business markets has largely ignored the role of the individual manager in pricing decisions and the idiosyncratic impacts they may have on the price setting process. This is in sharp contrast to other areas of business-to-business marketing, most notably organizational buying decisions, where the roles and impacts of individuals and groups are explicitly considered. For example, even the earliest comprehensive frameworks of organizational buying, such as those offered by Robinson, Faris, and Wind (1967), Webster and Wind (1972) and Sheth (1973) explicitly considered the fact that the purchasing manager as well as informal groups within the organization, such as the buying center, played a part in organizational buying decisions. Later research and frameworks have also explicitly recognized the role of buying center groups in various aspects of organizational buying decisions (e.g., Bellizzi, 1979; Johnston & Lewin, 1996; Kauffman, 1996; Kohli, 1989). In contrast to strictly rational economic frameworks, these models consider multiple influences on organizational buying. More specifically, they include individual influences on organizational buying calling specific attention to the organizational buyer's personal values and needs, as in the Webster and Wind (1972) model, and to the buyer's psychological world, as in the Sheth (1973) model.

Webster and Wind (1972) acknowledged that organizational buying may be affected by factors that are not strictly rational and economic. They labeled these influences as “nontask” factors and considered a variety of individual, social, organizational and environmental forces that affected otherwise rational economic organizational buying decisions. In Sheth's (1973) model, expectations and background, among other factors such as differences in information sources, search behaviors, perceptual distortion and satisfaction with past purchases were posited to influence decisions makers in industrial buying. Both these models consider and incorporate deviations from rational economic processes in their accounts of organizational buying.

Apart from the vast body of research on buying centers, there is also research within organizational buying literature on the influence of individual managers on the buying processes and decisions. While some research focuses on the demographics of managers, including their education, experience and position within the organization, there is also explicit recognition of the fact that individual managers may use different decision rules for evaluations, or may frame the decision context differently (Crow & Lindquist, 1982; Qualls & Puto, 1989). Moreover, individual managers may vary in their risk perceptions and how they manage such risks (Hawes & Barnhouse, 1987; Kauffman, 1996; Puto, Patton, & King, 1985). An early review of the organizational buying research also revealed individual managers' personality and motivation have been topics of research on the buying process (Johnston & Lewin, 1996).

More recently, organizational buying research has also focused on subjective evaluations by individual managers and buying centers (Brown, Zablah, Bellenger, & Johnston, 2011; Brown, Zablah, Bellenger, & Donthu, 2012). Specifically, research on perceptions of the business-

to-business brands suggest that brand cues are evaluated by buyers through use of subjective information as well (Brown et al., 2012). Thus, this research stream explicitly calls attention to the decision heuristics used by managers and contends that overtly "rational" approaches to organizational buying have not allowed for the examination of subjective judgments in organizational buying (Barclay & Bunn, 2006; Brown et al., 2011; Brown et al., 2012).

Such an examination of group and individual factors are largely lacking in research on pricing in business markets. There may be several reasons for this neglect in pricing research. First, even though buying centers are often informal and vary according to the buying decision, managers responsible for the purchasing function can be recognized from their position titles and from organizational charts. In contrast, the responsibility for the pricing function is not so readily discerned; it could reside with divisional managers, product managers, inter-departmental teams or may even be a C-suite decision. Second, while much of organizational buying research is conducted using actual organizational participants as respondents and informants and can be identified from organized sampling frames, large-scale empirical survey research on pricing is often conducted among experienced MBA and executive education students (see for example, Forman & Hunt, 2013; Hunt & Forman, 2006; Morris & Schurink, 1993, while some exceptions are studies in the European context in the decades prior reviewed by Ingenbleek, 2007). The lack of availability of ready populations for sampling restricts study of pricing decisions and behaviors to specific questions and also, more often than not, insights are often drawn from case studies and small sample qualitative research. What is lacking is a cumulative understanding of pricing practices from a wider variety of studies (Ingenbleek, 2007). Finally, it is possible that the conceptualization of organizations as rational entities may be pervading most of pricing research and may also be restricting researchers to include only objective information sources rather than pricing executives' subjective evaluations in their models.

However, a growing body of literature now suggests that managers may not follow a rational calculus (Ariely, 2009; Urbany, 2001) and do make pricing errors, some of them egregious enough to threaten the firm's financial stability. Part of the reason could be that pricing decisions may rely on easily understood or simplistic cost-plus or competitive parity pricing methods, while cognitive complexity may be devoted to other organizational decisions such as product design and development, sales, and promotion. Also, a strong cost focus often permeates the firm (Smith, 1995), given that pricing decisions may be embedded across both marketing and accounting/finance departments or subject to scrutiny and review by trained accountants within the firm. Managerial discretion, when available, manifests itself only as deviations from the list price through discounts and rebates. Even here, costs are often the primary consideration. For example, a salesperson may be authorized to not give more than say, a five-percent discount, often estimated from the margin loss the firm could bear for business development and/or additional sales. On the other hand, empirical research indicates that delegation of pricing authority to the sales force results in superior firm performance, especially under conditions when salespeople possess better market and customer information as compared to managers placed further from the decision contexts (Frenzen, Hansen, Krafft, Mantrala, & Schmidt, 2011).

Over the years, research with business-to-business marketing has developed and offered pragmatic frameworks and tools for managers (see for example, Anderson et al., 2000; Lancioni, 2005b; Morris & Calantone, 1990). In general, it is offered that systematic pricing plans would enable managers to avoid errors in their pricing decisions. Marketing, in general, appears to have discarded profit maximization objectives through pricing and instead, entreats the consideration of several diverse objectives (Morris & Calantone, 1990; Oxenfeldt, 1973; Skouras, Avlonitis, & Indounas, 2005), such as pricing to achieve target unit sales, revenues and market share. Similarly, when it comes to selecting a pricing method, an array of different techniques and approaches are offered from which managers could choose, with choice of the "best" method itself contingent on specific objectives and customer, market and industry factors, among other considerations (Anderson et al., 2000; Noble & Gruca, 1999).

We contend that a focus on the various behavioral issues that contribute to deviations from standard economic theory as well as to irrational pricing behaviors would lead to a more realistic conceptualization of the price setting process. In addition, such an explicit acknowledgment of irrationality would enable the development of frameworks and schemas that would help reduce serious errors in pricing that may detract from firm performance or even threaten its survival. In the next section, we offer a framework that would contribute to understanding the behavioral issues in pricing.

2. Understanding behavioral issues in the pricing process: towards a framework

As argued earlier, our understanding of ways prices are actually set by firms would not only enable the development of better normative frameworks for pricing but also enable researchers to propose models and frameworks that are more realistic. Rational and normative pricing models are often structured as conditional if-then logical statements. In such models, there is little scope for roles played by managerial discretionary decision making. In reality, however, pricing decisions, even though aided by decision models, are the purview of specific individuals and groups in the organization. Despite similarities in contexts and availability of decision making models, pricing decisions may suffer from unwarranted risk avoidance (Guiltinan, 1976; Hunt & Forman, 2006), inappropriateness of chosen objectives (Smith, 1995), perceptions of lack of decision making control (Hinterhuber, 2004; Lancioni, 2005a), inflexibility in decisions (Monroe & Cox, 2001), and lack of knowledge of sophisticated methods (Morris & Morris, 1990).

The impetus for the study of managerial impacts on organizational decisions as well as irrationality in pricing behaviors stems from various contributions to our understanding of behavioral dynamics within and across organizations and theories of decision making that explicitly consider rational limits on human cognitive capabilities (e.g., Cyert & March, 1963; March, 1978; Simon, 1955, 1957). Simon (1955) was prescient in advancing the notion that humans are limited by cognitive and calculative abilities to analyze all the information needed to make accurate rational choices. This form of bounded rationality, while appearing to lead to rational decision making, may be rational only in intentions and not always in its outcomes. Instead, individuals in organizations engage in satisficing rather than optimizing (Simon, 1957). The limitations imposed by bounded-ness of rationality are particularly severe when decision makers face situations that are uncertain, complex and/or ambiguous (Duncan, 1972; Spender, 1989; Williamson, 1975).

Behavioral decision theories have identified several strategies through which managers reduce the complexity in decision making and/or deal with perceived uncertainty (Cyert & March, 1963; March, 1978; Nelson & Winter, 1982; Simon, 1947; Weick, 1979). Complexity and uncertainty are often dealt with through simplified mental models that attempt to organize knowledge about the environment (Cyert & March, 1963). More importantly, managers attempt to satisfice rather than optimize (March, 1978) and/or follow various rules-of-thumb or routines or heuristics (Kahneman, Slovic, & Tversky, 1982; Nelson & Winter, 1982). While such simplifications lead to decisions, the resulting decisions may not be fully optimal.

Pricing research in industrial markets does acknowledge the role of managerial discretion in the price setting process as well as the decision making errors attributed to managers (Liozu, 2013; Liozu, Boland, Hinterhuber, & Perelli, 2011). However, there is less attention given to putative behavioral issues, particularly the heuristics that may contribute as aids in reducing decision making complexity but also biases that could contribute to bad decisions (Hammond, Keeney, & Raiffa, 2006; Liozu, 2012). In the context of pricing, Liozu (2013) elaborates

managerial attempts to simplify decisions as those of satisficing, following rules of thumb, defining standard operating procedures and organizational routines, and distributed cognitions.

One way to conceptualize the impact of managerial factors in pricing frameworks is to treat individual and group characteristics as specific exogenous factors that impact the price setting process. Indeed, as noted earlier, comprehensive models of buyer behavior consider individual and buying group factors explicitly in models of organizational buyer behaviors. In terms of pricing research, this would lead to examination of various individual and group factors, including but not limited to, managerial characteristics (e.g., age, education, experience, position in the firm), managerial attitudes and dispositions (e.g., risk taking, conservativeness), and group dynamics (e.g., internal politics, group power).

Another way to include the impact of managerial factors in pricing frameworks is to understand how managerial interpretation of issues as well as their biases and heuristics influence the price setting process. In such a framework, there is explicit recognition of the fact that price setting process is influenced not only by contextual factors but also by managerial judgments, and for better or for worse. For example, the impacts of contextual factors such as present in the environment as well as within the organization on the price setting process could be moderated by managerial factors, as shown in Fig. 1. In such a framework, there is explicit consideration of individual and group judgments that could contribute to decisions other than those suggested by normative frameworks.

The effects of environmental context on organizational decisions has been studied not only by researchers within business-to-business marketing but also by those in the broader disciplines of strategic marketing and general management. Specifically, with respect to pricing, Morris and Schurink (1993) identify three specific environmental influences – rate of environmental change, market structure heterogeneity and competitive rivalry – on the pricing behaviors. The rate of environmental change or environmental dynamism refers to the pace and extent of changes in the firm's environment (Miller & Friesen, 1982; Morris & Schurink, 1993). Higher rates of change may call for aggressive pricing and frequent price changes. Market structure heterogeneity refers to the extent to which markets are characterized by homogeneous versus heterogeneous sources of supply as well as customer requirements (Morris & Schurink, 1993; Sheth, 1985). These would impact whether the firm's price objectives are uniform across various markets or customized to specific markets. Competitive rivalry is the extent to which one or more competitors are in intense competition with the firm for the same groups of suppliers and/or customers. Here, pricing objectives, method and initial prices may be pegged to the competition rather than flowing from solely internal considerations.

Apart from the environmental context, several aspects of the organizational context, or forces within the organization, also have impacts on the price setting process. For example, Lancioni et al. (2005) demonstrate that different groups and departments within the firm may create hurdles and obstacles in the development and implementation of pricing strategy. Also, bureaucratic structures may increase internal administrative and overhead costs (D'Aveni & Ravenscraft, 1994), which could be reflected in the higher initial prices and/or lack of price flexibility. The degree of autonomy and control over pricing would affect not only the selection of pricing objectives but also the choice of pricing methods and the flexibility in pricing. On one hand, it appears that CEO influences in price setting actually enhances pricing capabilities, but on the other hand, it may be argued that top management involvement in price setting reduces the decision-making autonomy of functional managers (Lancioni et al. 2005; Liozu & Hinterhuber, 2013). Recent research has also shown that a firm's pricing capability is a distinct organizational resource and an important source of competitive advantage (Dutta et al., 2002; Liozu & Hinterhuber, 2014).

The above discussion provides a summary view of how some forces in the environmental context and organizational context would affect the price setting process. However, the discussion thus far does not take into account individual managerial issues in decision making. From the current literature on behavioral decision making approaches, we can identify issue interpretation, cognitive biases and heuristics as three major managerial factors that would affect the influence of contextual forces on the prices setting process (see Fig. 1). We briefly discuss each of the three factors below.

2.1. Issue interpretation

Research in organizational behavior, drawing from influences from psychology and sociology, has brought attention to how the context affects individuals and groups (Mowday & Sutton, 1993). Specifically, it has been shown it is important to understand how decision makers interpret their contexts (Mowday & Sutton, 1993; Thomas & McDaniel, 1990). The relevant context can be interpreted as an "opportunity" or a "threat" (Dutton & Jackson, 1987; Thomas, Clark, & Gioia, 1993). As Dutton and Jackson (1987; p. 80) elaborate: "the opportunity category implies a *positive* situation in which a *gain* is likely and over which one has a fair amount of *control*; in contrast, the "threat" category

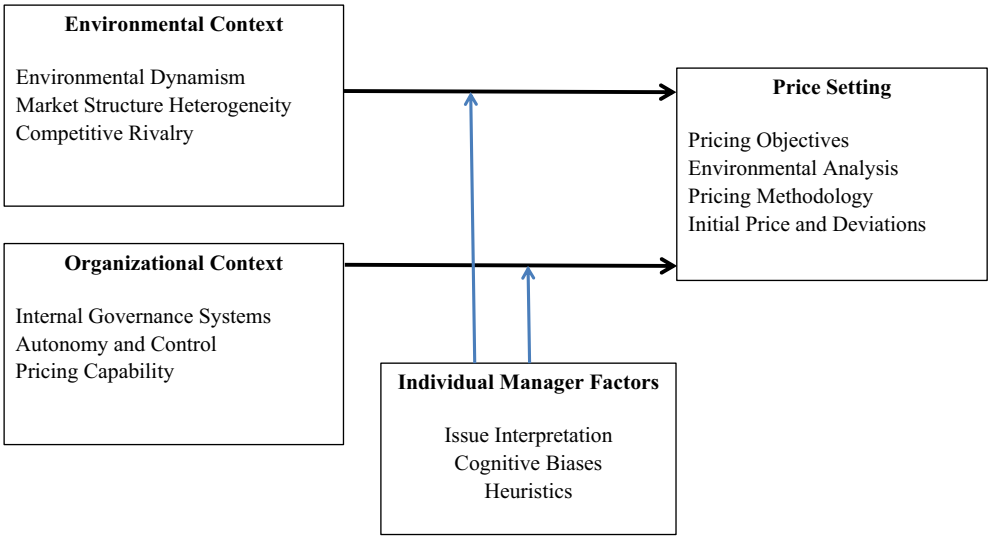

Fig. 1. A conceptual framework for understanding the interpretation of context on pricing strategy.

implies a *negative* situation in which a loss is likely and over which one has relatively *little control*" (emphasis in the original). Thus, the elements needed for categorization of the context as an opportunity or threat are the perception of the situation as positive or negative, the evaluation of the outcome as a gain or loss, and the perception of control.

In terms of the framework offered in Fig. 1, both the environmental and organizational context could be subject to interpretation as opportunities or threats. As Thomas et al. (1993) develop from the literature, the specific interpretation of the context matters since it affects not only the mobilization of action in a particular direction but also the levels of risk taking, involvement, and commitment. Thus, interpretation of the environmental context or the framing of the strategic issue would contribute not only to the depth of decision-making but also the decision choices made. In the case of price setting, interpretation of the context as an opportunity may enable the involvement of multiple groups from the organization in the price setting process (Dutton & Jackson, 1987); contribute to the development of risk-taking objectives and price taking strategies, and; may lead to prices that attempt to skim the market. On the other hand, interpretation of the context as a threat could lead to more conservative and isolationist approaches to price setting. Therefore, how managers interpret the context must be made a relevant factor in the study of pricing behaviors in business-to-business contexts.

2.2. Cognitive biases

Recent approaches in the field of behavioral economics and behavioral decision making suggest that far from expecting rational decision-making within organizations, managers are "fundamentally irrational" and their decisions are influenced by cognitive biases (Ariely, 2009). Simply defined, cognitive biases are subjective opinions or predispositions that may be due to the systematic use of some simple decision rules, heuristics, or "rules of thumb" (Bazerman, 1990; Das & Teng, 1999; Kahneman et al., 1982). The resulting decisions often deviate from outcomes that are suggested by the application of a rational calculus (Ariely, 2009; Lovallo & Sibony, 2010). Thus, in the context of pricing, the consequent impact of individual factors in price setting could lead to deviations from prices suggested by normative frameworks (Urbany, 2001).

While the study of behavioral biases within marketing is more prevalent for understanding consumer markets, there is scarce research within marketing of the various psychological and group decision biases that are held by managers, especially pricing decision makers. We extract, primarily from the fields of behavioral economics and behavioral finance, some relevant biases that may affect each stage of the pricing plan comprising of setting objectives, determining demand, determining costs, analyzing competition, selecting a pricing method and setting the price. These are summarized in Table 1.

Apart from the above studies, the relative neglect of studies of behavioral biases in business-to-business markets, especially within pricing, may be due to the assumption that individual factors matter less in a firm's strategic decisions. However, research within finance and strategy literatures suggests that managers in organizations that have systematic processes for collective decision making are also prone to several behavioral biases.

Table 1 organizes the pricing issues along the lines of the systematic pricing plan suggested by Lancioni (2005b). Several putative behavioral

Table 1
Putative behavioral biases and implications for pricing.

Pricing stage	Putative behavioral biases	Implications for pricing	Sample research on reducing bias in pricing
Selecting the pricing objective	*Loss aversion*: managers may choose less risky objectives to avoid losses (Tversky & Kahneman, 1991; van Dijk & Van Knippenberg, 1996) *Good enough returns*: Managers may satisfy on their objective rather than optimize (Kahneman & Tversky 1979). *Endowment effect*: what is owned is preferred to what can be obtained (Thaler, 1980)	Inappropriate pricing setting (considered safe) may be chosen in pricing. For example, instead of a product leadership strategy for quality products, managers may undervalue quality and choose a safer objective (Tellis & Johnson, 2007). Managers may be more focused on current markets rather than pursue strategies of gaining customers from competitors through pricing.	Perspective Taking. Taking the perspective of others or thinking of decisions as making them for others reduces biases (c.f., Andersson, Holm, Tyran & Wengström,2013). Adaptive Learning – learn through feedback on previous decisions (Al-Najjar, Baliga, & Besank, 2008).
Estimating and determining demand	*Overconfidence*: managers may believe strongly in their own knowledge and information (Barber & Odean, 1999; Coval & Shumway, 2005; Daniel & Titman, 1999) *Correspondence bias*: errors are made when inferring dispositions from behaviors of customers (Vonk, 1999) *Representativeness bias*: desirable qualities are overvalued (De Bondt & Thaler, 1995)	Managers may incorrectly estimate demand for their products. Current consumers and markets may be valued more in order to maintain a positive self-image (Beggan, 1992). Managers may wrongly infer purchasing managers' preferences and intentions. Managers may assume that good companies are also good customers.	Information sharing within the firm, outside the firm (suppliers) and use of industry experts reduces demand determination biases (c.f., Ozer & Zheng, 2012, p5). Adaptive Learning (as above).
Estimating and determining costs	*Sunk costs fallacy*: past costs and investments influence future choices (Arkes & Blumer, 1985)	Managers may be focused on the recovery of past investments and include these in costs for pricing. Also, the purchase of an input under a long-term contract may be treated as a sunk cost rather than something that can be resold (Al-Najjar et al., 2008)	Mindfulness - Mindfulness can be increased by meditation that reduces the sunk cost bias (Hafenbrack, Kinias, & Barsade, 2013).
Competitive Analysis of Cost, Price Tactics, and Discounts/Rebates	*Anchoring and adjustment*: adjustments are made from some known information so as to arrive at values that are acceptable. However, the final values are close to the anchor (Tversky & Kahneman, 1974)	Despite adjustments, managers' perceptions of competitive actions may not change much. Therefore, prices may change despite new competitive information.	Feedback mechanisms on pricing decisions reduces biases (Al-Najjar et al., 2008; Ozer & Zheng, 2012). Use of Decision Support Systems reduces biases (George, Duffy, & Ahuja, 2000)
Determining a Pricing Methodology	*Familiarity bias:* managers may prefer tools and techniques that they know more than ones that are more appropriate (Huberman, 2001)	Familiar and currently used cost-plus approaches may be used even though the situation may call for other methods.	Improving understanding of managers' information environment and how uncertainty should be dealt with (Urbany, 2001). Use probabilities to make decisions (Fox & Levav, 2000).
Setting the price & deviating from list prices	*Status quo bias*: doing nothing when faced with choices (Samuelson & Zeckhauser, 1988)	Managers rely on current approach to price setting and also do not deviate from list prices even when the situation changes.	Revisit the pricing decision and create a new decision tree, highlighting customer preferences. Match data with external customer data.

biases that may affect managerial decisions are then identified from literature along with their implications for pricing. A link is attempted between specific biases that may be present at each stage of the pricing decision-making along with a descriptive impact of such biases. Two caveats are in order: one, some of the biases listed at each stage could affect other stages as well and two, the organization of the biases and impacts are not based on prior empirical research, which is currently lacking anyway. However, the putative behavioral biases could serve to make a case for understanding whether such biases are manifest in pricing decisions as well as the consequent impacts of these biases.

In the context of pricing decisions, such biases play an important role in interpreting the environmental context and also translating the organizational objectives into pricing behaviors. Managers may underestimate uncertainty and engage in overconfident decisions, or they may be satisfied with merely good enough performance outcomes. Table 1 provides the various possible biases that may impede the translation of organizational priorities, given the environmental context, into prices setting behaviors that could be considered optimal.

2.3. Heuristics

Research in behavioral decision theory has shown that individuals, including managers, use unconscious routines in decision making (Hammond et al., 2006). These heuristics serve to reduce or at least, help manage, the complexities in understanding the decision context as well as reacting to it. These rules are also enshrined in organizational routines and organizational knowledge, and process experience enables managers to learn heuristics (Bingham & Eisenhardt, 2011).

Prior literature has shown that managers rely on simple rules and methods of pricing so much that they appear to lack knowledge and understanding (Morris & Morris, 1990). Also, simple pricing methods, such as cost-plus pricing, are relied upon more than other more sophisticated approaches to pricing (Ingenbleek, 2007). In the context of behavioral decision theory, the application of the cost-plus heuristic is a managerial mechanism of coping with the complexity involved in pricing (Liozu, 2012). In a vast majority of cases, it is possible that such a heuristic enables effective price setting; however, in other cases, the application of inappropriate heuristic could result in damaging consequences for the firm's revenues and overall performance. Thus, knowing which heuristic is appropriate given the environmental and organizational context may serve to reduce some of the pricing errors. More importantly, periodic evaluation of the heuristics used and the contexts in which they are used could contribute to better decision making.

Two brief case examples on pricing of solutions and relationship selling illustrate the possible operations of managerial factors noted above in current pricing practices. The primary purpose of these vignettes is to highlight our contention that managerial issues in the price setting process may detract from effective price setting.

2.4. Pricing of solutions

Over the last several years, major firms such as IBM, HP and others have focused on marketing integrated customer solutions rather than merely products. Essentially, solutions involve an almost seamless integration of products and services that are customized to specific customer needs (Davies, Brady, & Hobday, 2006; Sawhney, 2006). The high levels of technical and commercial integration of solutions make these more than merely product or price bundles (Krishnamurthy et al., 2003; Sawhney, 2006). Customized and well-integrated solutions promise to offer great value to customers and greater margins for the firm; however, it has been suggested that only few firms have been successful in their solutions marketing strategies (Johansson et al., 2003; Krishnamurthy et al., 2003). In fact, one study noted that as many as three-fourths of the firms that had tried offering solutions failed to achieve their objectives (Krishnamurthy et al., 2003). It was observed that only 20 to 25% of the firms realized price premiums from their solution offerings (Roegner & Gobbi, 2001). Apart from issues in the design, development and marketing of solutions, one major reason why many solutions marketers failed to recover the high costs of investments is because customers often did not perceive the premium prices charged for solutions as justified compared to their own valuation of the offerings (Johansson et al., 2003; Krishnamurthy et al., 2003; Sharma & Iyer, 2011). This was because firms priced their solutions only after they were developed rather than much before and many simply extended their existing pricing methods to solutions (Johansson et al., 2003; Roegner & Gobbi, 2001).

Thus, rather than focusing on customer value, target prices and appropriate pricing strategies, firms treated a radically different offering quite the same as far as pricing was concerned. Given the very different context (solutions as compared to individual products or even product bundles), managers may have been quite optimistic in viewing solutions as an opportunity to extract premium prices without considering whether such solutions enhanced customer value. Thus, the interpretation of the context as an opportunity could have led to greater risk taking and possibly less in-depth analysis of the situation and the pricing decision.

It could also be possible that managers may be operating under a status quo bias and did not perceive that integrated solutions were novel offerings that required changes to existing pricing outlooks and price setting processes and/or the use of new methods to price integrated solutions (see for example, Samuelson & Zeckhauser, 1988). Or, managers may be subject to a familiarity bias and prefer existing heuristics, such as cost-plus pricing, that they are more familiar with (see for example, Huberman, 2001), rather than use new methods to understand and extract customer perceived value of integrated solutions. Thus, behavioral approaches enable us to go beyond simply the decision and its consequences and help identify possible causes for suboptimal prices and eventually, help minimize their impacts.

2.5. Relationship pricing

While relationship marketing approaches have been in vogue in various industries since the 1980s and in academic literature on business-to-business marketing soon after, few firms have been successful in developing and implementing profitable customer relationship marketing strategies (Richards & Jones, 2008). The profitability of a relationship marketing approach hinges on the assumption that loyal customers would pay premium prices. However, this is not always true and firms often do not take into account the different costs of serving different types of customers when determining the price (Reinartz & Kumar, 2000). While techniques are available that would help firms better segment their customer base and price accordingly (Rust, Lemon, & Zeithaml, 2001), there is scant evidence to suggest that pricing in relationship settings is taken as seriously as it should be. In fact, evidence from commercial banking suggests that many commercial banks do not invest in creating relationships with their customers and their pricing remains "poorly informed and inconsistent" (Helps & Saari, 2005). Thus, rather than focusing on the long-term relationship, firms often take a much narrow view of the market and engage in pricing over the transaction rather than through the relationship (Nunes & Hanson, 2012).

From the behavioral perspective, such a short-term focus on relationships may be the result of a loss aversion bias (see for example, Tversky & Kahneman, 1991). Managers may be operating under the assumption that costly investments upfront in building relationships may often lead to losses over the long-term, especially when the firm and customers engage in easily terminable contractual relationships or non-contractual relationships. Thus, a behavioral perspective may help us understand the reasons why managers view short-term profits (including profits from transactional customers) as more important compared to longer-term recovery of investments from relationships (Reinartz & Kumar, 2000).

3. Implications and extensions to theory and research

Descriptive realities of the individual influences on price setting within organizations can be explained by two alternative perspectives. One, the popular research stream pioneered by Tversky, Kahneman and others maintains that individuals are subject to biases and these biases contribute to deviations from behaviors and outcomes that are suggested by normative models of economic decision making (Kahneman et al., 1982; Tversky & Kahneman, 1974). Thus, this perspective holds that while models of economic rationality may suggest specific optimal decisions and outcomes, actual decisions are often suboptimal and error-prone due to biases in human inference (Gigerenzer & Goldstein, 1996).

The second perspective that has often developed under the shadow of the biases program noted above maintains that economic rationality is a myth and optimality is a chimerical objective. This perspective is more directly influenced by Herbert Simon's (1955) views of bounded rationality and maintains that the goals of individuals and systems are those of satisficing rather than optimizing (Gigerenzer & Goldstein, 1996). Thus, the appropriate goal is to seek out the option, alternative or object that meets the organism's aspirational level rather than engage in a complex and unachievable search for optimality that is doomed at the outset, given limits on human cognition and computational abilities (Gigerenzer & Goldstein, 1996; Simon, 1955).

While we are not in a position to engage in or even add to the debate between the two perspectives (see, for example, Kahneman & Tversky, 1996; Gigerenzer, 1996), suffice it to say that both perspectives point to limits in individual decision-making that may lead to suboptimal decisions. In the case of prices, whether approached from the perspectives of biases or from the objectives of satisficing, suboptimal prices are a reality and could detract from supra-organizational objectives, including long-term profits.

Behavioral research on pricing is now the dominant framework for analyzing pricing within consumer marketing. For over the last four decades, consumer perceptions of price and their reactions to prices and price changes have been the subject of much academic research on pricing. However, similar behavioral theories and frameworks are largely absent within business-to-business research. Part of the reason could be the conceptualization of business-to-business pricing as a rational organizational decision that is impervious to individual tastes and preferences. Therefore, it is possible that academic researchers view business-to-business pricing decisions as rational, with any pricing errors attributed not to psychological factors but to lapses in strategy.

The application of behavioral thinking to price setting by firms has the potential to enhance our understanding in several different ways. First, by challenging the assumption that prices are rationally set, it opens the door to pricing that works rather than prices that are optimal. This may bring theory and practice closer to appropriate pricing in different contexts rather than relying on general assumptions of rationality and optimality. Second, opening the door to considering behavioral biases as a contributor to suboptimal pricing leads to an examination of putative causes rather than offering normative frameworks that may be inappropriately applied in practice. Thus, there may be an explicit re-examination of current theory rather than merely critiquing practice for failure to follow theory. Third, the study of behavioral biases helps understand reality as it is rather than whether a theory applies to reality. This key focus on ontology enables descriptive theories that would complement deductive logic to help us better grasp realities.

Using insights from other disciplines, primarily behavioral economics, a behavioral approach to strategy brings the field of strategy closer to reality by taking into explicit account "realistic assumptions about human cognition, emotion, and social interaction" (Powell, Lovallo, & Fox, 2011; p. 1369). Behavioral approaches do not reject rationality; instead, they reject the rationality in humans as an unchallenged assumption and optimality as the desired and achievable objective. Cognizant of the bounded-ness of human rationality as well as the variety of biases in decision making, behavioral approaches view rationality as a process, not as something that is given or as an outcome (Levinthal, 2011; March, 1994; Simon, 1955). In the behavioral world, only presumed rational choices are made, satisficing is more relevant than optimizing, and analysis and actions reveal the boundary conditions of decision making and choices (Levinthal, 2011; March, 1994; Simon, 1955).

Within business-to-business marketing, the focus on normative models of increasing sophistication tends to move us away from a more accurate picture of the real world. While deductive logic may be a useful starting place, descriptive and empirical realities tell us how it is really out there. Such revisions to our conceptions of reality would help us develop theories not only for a better understanding of the business-to-business world, but also for providing practical guidelines for managerial action. We offer some approaches to research and theory in the section below.

3.1. Implications for theory building

While behavioral issues and biases have been a focus of inquiry within marketing for some time now, there has been less emphasis on the exploration of these themes within the area of business-to-business marketing in general, and managerial pricing strategies, in particular. We have made only a preliminary and exploratory contribution to the study of behavioral biases in price setting, including the types of biases that may detract from optimum prices in business-to-business marketing. As noted by Powell et al. (2011), the key concern in behavioral strategy is not good research but "a lack of conceptual unity" (p. 1371). While some prior research has pointed to suboptimal pricing behaviors (notably, Kopalle et al., 1999; Little & Shapiro, 1980, and; Urbany, 2001), we have explored the idea that behavioral biases could result in suboptimal managerial price setting behaviors. In other words, we have introduced the possibility that suboptimal price setting by managers may be due to various inherent biases and predispositions held by them. Behavioral approaches to understanding suboptimal pricing goes beyond merely identifying the incidence or prevalence of suboptimal pricing; instead, by explicitly considering the possibility that managerial decisions may be biased, the door is opened for an examination of what was wrong with decisions and how decision making may be improved. By questioning managerial assumptions and engaging in behavioral experimentation, as suggested by Ariely (2009), firms can begin to understand irrationality and engage in decisions that could confront biases and reduce their impacts (Lovallo & Sibony, 2010).

The framework we have offered sheds some light on the various sources of behavioral biases that could impact price setting. However, as all frameworks go, there is a need to ground conceptual insights into empirical realities. This is especially true in the context of behavioral issues and cognitive psychology, wherein Gigerenzer (1991) notes that scientific tools could contribute to the development of new theoretical concepts and metaphors.

The recognition that human cognition and processing capabilities are limited and that human decision-making is subject to various biases is the first step in a behavioral approach to understanding pricing in business-to-business markets. While normative approaches may offer appropriate tools and techniques, the key issue may not be whether they work, but why they are not used more often. Moreover, the decision-making context may be more complex as compared to the simplistic assumptions in extant models of pricing. More importantly, the study of deviations from rationality offer a better perspective on the world we live in rather than the optimal worlds we should strive to live in. Therefore, understanding behavioral biases and confronting them head-on may be the best way to minimize the incidence of suboptimal pricing. However, since this research stream is still in its infancy, future research focus could be on identifying the various behavioral biases and unraveling their impacts, as noted below.

3.2. An agenda for future research

Some research on organizational buying, however, has been quite prescient in its acknowledgment of various behavioral and individual factors that affect otherwise "rational" buying decisions (Montgomery1975; Wilson, 1984; Woodside & Wilson, 2000). For example, Montgomery (1975) found that a vast majority of new items accepted by supermarket buyers were dropped within 12 months, suggesting a rather high frequency of mistakes in buying decisions. An analysis of buying decisions in the utility industry by Wilson (1984) revealed that prices were revised only annually unless adjustments were requested by vendors. Woodside and Wilson (2000) found that in marketer-buyer relationships in business-to-business contexts, both parties framed "problems and people using a limited number of issues and categories" (p. 365). This suggests that instead of exploring all possible alternatives, contingencies and outcomes as suggested by rational economic models, managers relied more on implicit and limited decision framing processes.

Given the lack of research on behavioral issues in business-to-business pricing, leave alone the research on biases in such pricing, much work needs to be done to obtain a state-of-the-art knowledge of extant realities. Within the area of pricing research, Urbany (2001) was prescient in his call for research that would enable greater understanding of errors in pricing, their contributory causes, and consequent impacts. In an attempt to understand how cognitive biases may affect price setting, we have only made a beginning in identifying possible biases that could impact price setting processes in the business-to-business marketing contexts. We hope that this beginning may be an appropriate start for attempts to answer other relevant questions empirically to further our knowledge on the specific types of cognitive biases and how they impact the pricing decision in organizations. Some these directions for future research are briefly elaborated below.

3.2.1. What manifest forms of behavioral biases impact pricing decisions?

Currently, except for a few frameworks, we do not have adequate knowledge of what types of biases may be present in business-to-business marketing pricing decisions as well as how these may contribute to suboptimal pricing and other systematic errors. We need more cross-industry research to identify the phenomena and understand the potential manifestations of various behavioral biases. Moreover, it may be possible that different forms of behavioral biases may be manifest in different industries or in the same industry across different country contexts. An important research question may be: what are the most relevant biases operational in pricing decisions within specific organizations, industries, or cultural contexts?

3.2.2. How and to what extent do behavioral biases impact pricing decisions?

While some forms of biases may not be much cause for concern, severe deviations from rationality and optimality need to be understood. We need empirical research on the extent to which various behavioral biases may contribute to suboptimal decisions. Here as well, the impacts of biases in some industries may be more severe than others. For example, given the high costs of drug development, the impacts of biases may be more severe in the pharmaceutical industry as compared to other industries. Research specific to industries may be needed, even if such industry research is considered by some as less academic. An important research question may be: What are the consequent impacts of various biases, given the premise that irrationality is simply human nature and that some forms of biases may have a more deleterious impact than others that are merely benign?

3.2.3. How do managers rationalize their pricing decisions?

Given the possibility of behavioral biases, do managers recognize their own failures? If not, how do managers rationalize their pricing decisions, especially given the fact that pricing decisions in business-to-business contexts may need organizational approval and review? Research is needed not only on managerial cognitive frameworks but also on their explanations for the various pricing decisions taken. Such research may also uncover broader group and organizational influences on suboptimal pricing, beyond the control of individual managers. Thus, while biases may be hidden from view, the decision and its consequent impacts can be observed. For example, Lovallo and Sibony (2010) suggest that confident managers are more likely to have their plans approved as compared to those who identify all the various risks and eventualities inherent in the decision. When confidently proposed plans fail, managerial assumptions need to be re-examined. Thus, apart from identifying managerial biases as contributing to specific decisions, an important research question may be: How are bad decisions rationalized?

3.2.4. How do behavioral biases in pricing play out in different cultures?

While research on international pricing has focused on offering normative models for use by export and other international managers, we know less about the price setting process in different cultural contexts. For example, is price setting in traditional cultures the sole prerogative of the senior executive? An important research question may be: Does price setting in different cultures impacted by various other behavioral biases? We need research on identifying the cultural incidence of various biases and their impacts to fully understand the cultural context of pricing.

3.2.5. What strategies should be adopted to minimize biases and their impacts?

While much of the research on behavioral strategy has been descriptive while business-to-business pricing is more normative, we need to understand what managers and organizations could do to minimize the various potential behavioral biases and their impacts. An important research question may be: What is the effectiveness of various techniques for reducing biases including intra-company coordination, reliance on internal experts, use of outside experts and consultants, and pre-implementation review, among others?

3.2.6. What is the nature of exchange when both managers and their customers are subject to behavioral biases?

While extant research on behavioral biases is one-sided, that is, focused on understanding either only individuals, groups or consumers, business-to-business marketing is dyadic. If current research on behavioral issues and biases in pricing from consumer markets could be extended to business customers, then such customers would be prone to biases in their purchasing decisions. However, if managers are also subject to biases, the very nature of the exchange relationship may be drastically different. An important research question may be: How do two biased parties to an exchange view, set and accept prices? Such a research stream could also gain from the vast amount of research done in the area of business negotiations.

3.3. Methodological approaches for future research

There are several inductive approaches already known to marketing and industrial marketing scholars that have the potential to bridge the gap between the behavioral biases we have explored and empirical realities in price setting. In a seminal contribution, Howard and Morgenroth (1968) use a novel approach to study executive decision making, especially with respect to price setting. Given the problems in studying executive decision rules either before or after the fact, they used multiple approaches to gain an in-depth and more accurate understanding of how executives actually take decisions and if such decisions deviated from the optimum. A complex multi-source multi-method research design was used, including interviews, observation of the processes, records of past decisions and various supporting data along with further reviews with responding executives (Howard & Morgenroth,

1968). Thus, better insights into actual decision-making can be obtained.

Similarly, research in the field of organizational buying has used methods such as the analysis of verbal protocols in understanding the processes and realities of decision making (Crow, Olshavsky, & Summers, 1980; Woodside & Wilson, 2000). Woodside and Wilson (2000) find it most appropriate to use verbal protocols or the "think aloud method" (van Someren, Barnard, & Sandberg, 1994) to understand contingency models relied upon by executives in decision making. Using a novel research method that combines the use of thick descriptions – an approach pioneered in anthropology, most notably by Geertz (1973) – along with creative uses of think aloud method and interviews, Woodside and Wilson (2000) demonstrate that even complex aspects of decision making can be mapped by tapping into the thoughts and behaviors of decision makers in real-life situations.

Other more direct approaches to counter biases include behavioral experimentation, as suggested by Ariely (2009) and leadership commitment and cultural change, as suggested by Lovallo and Sibony (2010). Ariely (2009) contends that firms and managers must question their assumptions and engage qualified experts who would help the firm in behavioral experimentation and small trials. Similarly, Lovallo and Sibony (2010) suggest that biases should be recognized and discussed within the organization and confronted directly with debiasing practices and tools.

What we have offered here are the first steps — the contention that suboptimal pricing may be the result of various behavioral biases and an identification of the relevant biases affecting price setting. However, understanding decision making in its actual context offers the best potential for uncovering the implicit decision rules and the biases in decision making.

3.4. Challenges of behavioral research

Answers to the above research questions would greatly enhance our understanding of the complexities involved when behavioral biases affect pricing decisions. However, such research may not be easy to undertake. For one, the types of controlled experiments that are in use in the areas of behavioral economics and marketing may not be possible among busy executives in business-to-business contexts. Secondly, given organizational and career pressures, managers may be less forthcoming about their choices, especially through methods such as personal interviews. Third, empirical research on uncovering group level biases may be hard to undertake.

However, given the increase in executive education programs in business schools, several practicing managers are now enrolled as students in such programs. These manager-students not only provide a somewhat homogeneous sample but may also be more willing to participate in academic research. With suitable sample selection criteria, methods that are used in other disciplines to study behavioral biases can also be applied to understand biases in business-to-business pricing. Thus, despite challenges, the field is rife with opportunities for future research.

3.5. Implications for managers

The idea that managerial decisions may be subject to various biases that yield suboptimal outcomes may be quite distressing for managers keen on taking the best decisions and obtaining the best results. Also, given bounded rationality and satisficing, optimality may be an illusory objective. However, despite such pessimism, recent research actually suggests that a variety of approaches and heuristics actually followed by decision makers results in decisions that either overcome some of the limitations of the various biases or contribute to decisions that are sometimes even better than those suggested by models of optimality. For example, we can use research by the medical profession that seeks to reduce biases in decision-making by doctors as a starting point.

Examining a variety of research conducted in the context of business, health care and legal organizations and institutions, Gigerenzer and Gaissmaier (2011) conclude that heuristic decisions, rather than always contributing to errors, are sometimes quite valuable and more accurate in decision making. Heuristics are prompted by effort reduction considerations and enable making decisions rapidly with minimal information, and sometimes more accurately, as compared to complex models (Gigerenzer & Gaissmaier, 2011). Thus, simple and/or intuitive heuristics that are adaptive often reduce errors in decision making.

In the last column of Table 1, we offer various insights from prior research on how the biases noted at each stage of price setting may be reduced. An important insight is the role of adaptive learning – that is feedback that is obtained from prior decisions – in reducing biases and errors in the future (Al-Najjar et al., 2008; Senge, 1994). Thus, it is possible that experts are those individuals in organizations who learn through experience and thus, refine their decision making abilities to the extent that the outcomes of their decision making rivals complex models. Given limits on attention and memory, experts reason analytically and intuitively and gain constantly from experience (Prietula & Simon, 1989).

4. Conclusion

Suboptimal pricing by decision-makers could be attributed to a variety of factors. For one, pricing involves inputs from multiple divisions within the firm, such as finance and accounting, among others, and stakeholders within and outside the firm, including intermediaries. Moreover, pricing involves considerations of a variety of complex factors within the firm, including appropriate costing and cost allocations, marginal profits, etc., as well as outside the firm, including customer demand and competition. The complexity of the pricing process itself may contribute to suboptimal price setting in business-to-business markets.

Second, accuracy in pricing may call for information beyond what is available or can be obtained by the decision-maker. Normative models of pricing may require detailed information of demand and supply as well as future projections of costs and demand. The absence of complete and accurate information may also contribute to prices that are recognized as suboptimal only at a future date and after detailed examination.

Third, pricing is a decision that needs to be continuously examined and frequently adjusted. This calls for detailed information on the environment as well as information on the impacts of prices on the firm's marginal profits. The inability to respond to such internal and external considerations fairly quickly may also contribute to pricing errors that affect the organization's objectives and performance adversely.

While impacts of various pricing errors emerging due to organizational factors could be minimized by appropriate organizational structures and emphasis on information gathering and information use, we have focused on the behavioral issues that may be more difficult to address. The study of business-to-business pricing is ready for a change from its extant focus on normative models and frameworks to descriptive research on how managers actually set prices. In this context, the various behavioral biases identified in other disciplines could provide explanations for suboptimal pricing as well as deviations from rational price-setting. In this paper, we have merely scratched the surface of a rich, growing and rewarding field of inquiry and are hopeful that future research would greatly enhance our understanding of pricing practices in business-to-business marketing. Such an understanding would serve to greatly reduce the wide chasm between academic theory and managerial practice.

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Examining the application of behavioral price research in business-to-business markets

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ABSTRACT

Business-to-business (B2B) and business-to-consumer (B2C) markets differ in many ways as documented in the contemporary marketing literature. However, many behavioral characteristics of human beings – particularly those related to judgment and decision-making – are present across diverse contexts. From this insight, we derive a proposition: many behavioral price concepts developed in the past B2C behavioral price research may be applicable in B2B context as well. The objective of this paper is to examine this proposition through analyzing the existing evidence on five important behavioral price concepts: reference price, price thresholds, acceptable price range, price as an indicator of quality, and the price–perceived value model. At a more general level, the objective of this paper is to demonstrate the importance of recognizing how buyers' responses to prices and price information differ from the traditional assumptions about such behaviors in B2B marketing literature.
The results provide strong evidence for the applicability of the reference price concept in B2B markets. The price–perceived value model is widely applied in B2B pricing, although in narrow form. Use of price as an indicator of quality also receives some support. For price thresholds and acceptable price range little research activity exists in B2B domain. Overall, while there has been some behavioral price research specifically in a B2B context, nevertheless it is comparatively sparse, and for some concepts virtually non-existent. We end the paper with a call that more behavioral price research is needed as such research has potential to help business marketing managers make more effective pricing decisions.

1. Introduction

Pricing directly impacts profitability and therefore, the ability of a firm to expand, improve offerings, better serve its customers and reward its employees and owners. Although pricing is a major concern of firms in business markets it has received relatively little research attention (Dant & Lapuka, 2008; Liozu & Hinterhuber, 2013; Reid & Plank, 2000). Similarly, behavioral price research has received scant attention in B2B research perhaps because of a prevailing assumption that B2B buyers are "rational." That is, traditionally it has been assumed that organizational buyers rely on objective information and process price information completely and accurately (Reid & Plank, 2000; Sherlock, 1991, 1992; Wilson, 2000) and, therefore, devoid of well-documented human behavioral imperfections.

Due to the limited attention on B2B behavioral price research, price researchers face a fundamental dilemma: how separately should we develop the behavioral price theory for business-to-business markets relative to that of business-to-consumer markets? Wilson (2000, pp. 780–781) voiced a similar question regarding the theory of buyer behavior: "Why should we assume that separate theories are necessary to explain the exchange behavior adopted by the same individual when placed in different contexts?"

This question is particularly important in the pricing domain as the vast majority of past behavioral price knowledge and theory has been developed in a B2C context, producing a wealth of applicable concepts and insights. If B2B behavioral price theory were developed in isolation from the progress previously gained in consumer-oriented research, the progress of B2B behavioral price research will unnecessarily be hampered as scarce research resources may be devoted to reinventing many of the basic behavioral concepts and findings that have already been nurtured in behavioral price research. The optimal degree of developing B2B behavioral price theory as a separate entity from that of B2C obviously depends on the perceived similarities and differences between these two markets.

Although B2B and B2C markets differ in many ways, many behavioral characteristics of human beings – particularly those related to judgment and decision making – are present across diverse contexts. Therefore we propose that many behavioral price concepts developed in previous B2C

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price perception research would be applicable in a B2B context as well. The objective of this paper is to test this proposition by analyzing existing evidence on five important behavioral price concepts: reference price, price thresholds, acceptable price range, price as an indicator of quality, and the price–perceived value model. More generally, our objective is to demonstrate the importance of recognizing that buyers' responses to prices and price information differ from the traditional assumptions about such behaviors in B2B marketing literature.

The five behavioral concepts were chosen, as they have been among the most important behavioral concepts in previous behavioral pricing research. Reference price and the use of price as an indicator of quality are among the most studied concepts in behavioral price research (see Cheng & Monroe, 2013; Mazumdar, Raj, & Sinha, 2005; Somervuori, 2012). Price thresholds and acceptable price range have been researched since the 1970s (Monroe, 1973). The price–perceived value model has been derived based on these fundamental concepts and has been applied widely (Grewal, Monroe, & Krishnan, 1998; Monroe, 2003). While this set of behavioral price concepts is not an exhaustive mapping of behavioral phenomena it captures much of the essence of previous behavioral price research.

We begin by first outlining the similarities and differences in B2B and B2C markets. Then we review the fundamental concepts of behavioral price research: reference price, price thresholds, acceptable price range, and price as an indicator of quality. Finally, we introduce the perceived value model. These latter two sections first review the essence of the underlying behavioral concepts based on previous research. Then we review the existing B2B research relevant to these concepts. In the discussion we summarize key findings and provide suggestions for future research.

2. Similarities and differences between B2B and B2C markets

B2B markets include challenges that differ from those in B2C markets. First, purchasing in industrial settings typically involves multiple people with complex interactions among themselves and their various individual and organizational goals (Bonoma, 1982; Lilien et al., 2010; Webster & Wind, 1972). Members of the buying unit in organizations may include an initiator, a decider, influencers, purchasers, a gatekeeper, and users (Bonoma, 1982). Depending on the situation the combination of members varies. The more complex and involved the buying decision, the larger the decision making unit (DMU) typically is and the more carefully the decision is considered (Johnston & Bonama, 1981). Second, in contrast to consumer markets, B2B markets typically are characterized by fewer buyers buying in larger quantities, involving more stakeholders, with purchase cycles that may take months or longer to complete (Lilien et al., 2010). Third, many offering related dimensions are held different between B2B and B2C markets, e.g., technical complexity of purchased offering (Webster, 1979) and negotiated price (Stanton, 1981).

Yet, as others have noted, there are misconceptions about these differences and whether findings from consumer research can be applied to business-to-business marketing (Dant & Brown, 2008; Fern & Brown, 1984; Wilson, 2000). Although B2B markets differ from B2C markets, similarities between organizational and consumer buyers exist. For example, even though differences with business-to-consumer marketing have been identified often there are multiple similarities (Fern & Brown, 1984). Moreover, all consumer level (B2C) retailing entails B2B components as the retailer must also deal with upstream channel members to serve the final customers.

Most importantly, many behavioral characteristics of human beings – particularly those related to judgment and decision making – are present across diverse contexts. For example, Simon (1955) made the well-accepted point that human beings have general limitations in capacity to process information. Helson (1964) and Kahneman and Tversky (1979) have found that all human judgments are made with respect to a frame of reference. Stanovich (2010) indicated that the various human decision-making strategies – although often found through artificial experimental studies – have been observed across a wide array of dissimilar decision-making contexts, including business decisions. Also, Wilson (2000, p. 781) referred to the "fundamental similarities within human choice-making" when comparing B2B and B2C markets.

Thus, many similarities between B2B and B2C markets stem from psychology and behavior that are inherent to human behavior for individuals irrespective whether they are working in organizations or acting as consumers. Bunn (1994) argued that in organizations human psychology and behavior influences, for example, on procedural control of decision-making, focus on company or operational level goals, use of analysis techniques and search of information. Increasingly, it has been recognized that organizational decision makers use decision heuristics and a variety of marketplace signals and cues to facilitate their decision process (Moorman, 1995; Ronchetto, Hutt, & Reingen, 1989). Managers develop these to simplify their decisions and to cope with complexities. Evaluation often also includes qualitative judgments in addition to use of systematic and sophisticated analysis techniques (Bunn, 1994).

Just because the purchase and use of a product is for business and not for personal consumption does not negate the fact that people do not always process information in a rational manner (Dijksterhuis, Bos, Nordgren, & van Baaren, 2006; Leek & Christodoulides, 2012; Sherlock, 1992). There is simply too much available information to "aid" in their decision-making. Also, more information does not necessarily mean better decision-making (Gigerenzer & Gaissmaier, 2011). Not only is processing all the information impossible for a human mind in most situations, we also cannot analyze all available information due to both mental as well as time constraints (Simon, 1955).

So how do people make decisions? Instead of cognitively calculating all the weights in preferences of different options to make a decision, even the most "rational" of people use feelings to assist them (Bechara & Damasio, 2005; Rick & Loewenstein, 2008). Behavioral researchers from multiple perspectives agree that the initial response to any environment typically is affective, and that this emotional effect generally guides subsequent behaviors within that environment (Crosby & Johnson, 2007; Machleit & Eroglu, 2000). Research has shown that the affect area of the brain is frequently activated first when we make decisions (Davidson & Begley, 2012). Impressions and affect influence what we perceive prior to cognitive analyses (van den Bos, Vermunt, & Wilke, 1997). Each of the above points is relevant because setting prices or making purchase decisions is an issue of perception or how we see and interpret information.

Consumers and business-to-business purchasers alike, often first decide, perhaps non-consciously, and then cognitively rationalize the decision (Knutson, Rick, Wimmer, Prelec, & Loewenstein, 2007; Lehrer, 2009; Sherlock, 1991, 1992). Emotions are an important aspect of price, product, brand, and supplier evaluations (Leek & Christodoulides, 2012; Somervuori & Ravaja, 2013). Therefore, it is important to understand how buyers respond to price as a stimulus and as an indicator of quality and benefits, and to recognize that these mental processes often occur similarly in B2B and B2C markets.

3. Fundamental concepts of buyer behavior relative to price

As an important aspect of everyday life, price acts as a stimulus to people's senses. People respond to various types of symbols representing prices and pricing tactics such as price promotions. This section examines fundamental concepts concerning how buyers respond to price: reference price, differential price threshold, absolute price threshold, acceptable price range, and price as an indicator of quality (Monroe, 1973, 2003). It is imperative to note that these concepts explain how people form price *perceptions*. "Research has established that in reality, the effect of price is a matter of buyer

perception and is, therefore, subjective and not objective as economists assume" (Cheng & Monroe, 2013, p. 103).

3.1. Reference price

3.1.1. Introduction to reference price

Reference price research concepts have been developed from research in psychophysics and refined based on adaptation-level theory (Helson, 1964), range–frequency theory (Parducci, 1965), assimilation–contrast theory (Sherif & Hovland, 1961) and prospect theory (Kahneman & Tversky, 1979). The integration of these theories indicates, and recent research confirms, that people cannot compare magnitudes or numbers absolutely (Kadosh et al., 2005). All judgments of magnitudes, including price, are made relatively (Ariely, 2008). The focal stimulus is compared to some point or level of reference. This reference is not universal as it varies over individuals and changes with time and the frequency and variety of experiences as each individual encounters other similar stimuli.

A reference price is a dynamic, internal price to which an individual compares the price of a product or service (Cheng & Monroe, 2013). This reference price or ranges of price that form the reference price level are internal representations that may or may not correspond to any actual external price. The reference price concept is specific to an individual, a product category, a sales environment and a point in time. As such, an individual's reference price is unobservable and may not even be articulated by the individual. This reference price may be memory of the last price paid (accurate or not), last transaction price (Bruno, Che, & Dutta, 2012), a perceived average market price, the seller-supplied regular price, a competitor's price, an expectation of a fair price to pay, or the individual's experience with other similar products (Cheng & Monroe, 2013). Importantly, an individual's reference may be influenced by other prices or numerical stimuli at the point of price judgment and comparison (see for example Adaval & Monroe, 2002; Nunes & Boatwright, 2004).

3.1.2. Reference price effect in B2B

Reference price is among the most studied concepts in behavioral price research (see Cheng & Monroe, 2013; Mazumdar et al., 2005). However, reference price research in marketing primarily has focused on consumer-packaged goods (Bruno et al., 2012), leading to the question: Do reference prices influence buyers' judgments in business-to-business markets as well?

To answer this question, we resort to three types of evidence. First, it is logically plausible that reference prices influence purchase decisions in business-to-business transactions, as research in cognitive psychology indicates that all human judgments are made with respect to a frame of reference (Ariely, 2008; Helson, 1964; Kahneman & Tversky, 1979). Indeed, a small but consistent set of recent business marketing research confirms this expectation, providing our second line of evidence. Third, the negotiation science literature provides further support for the use of reference prices in business marketing, where negotiated prices are a norm.

As summarized in Table 1, Bruno et al. (2012) found that reference price effects exist on quantity purchased and on the price outcomes in B2B transactions. Customers were more sensitive to price increases than to price decreases (loss aversion effect), and salespeople had their own reference prices that influence the transaction price. They concluded: "Our estimates provide strong evidence that reference price effects exist in B2B transactions" (Bruno et al., 2012, p. 641).

Faranda (2011) found that business buyers use a market-based reference price when evaluating commercial insurance services. This effect was stronger in a competitive environment compared to a regulated one. Moosmayer, Schuppar, and Siems (2012) found that a seller's reservation price, aspiration price, and initial price offering influenced the agreed price in negotiations in the chemical industry. These three reference prices explained 86% of the variance in the negotiated settlement price. The seller's reservation price was a less important reference point relative to the aspiration price or the initial price offering.

Table 1
Empirical studies on reference price effect in B2B.

Study	Data and market type	Relevant findings
Bruno et al. (2012)	Customer transaction database of a UK company selling processed timber to industrial customers (e.g., furniture manufacturers, window manufacturers, decking contractors).	• Reference price effects exist on quantity purchased and on the pricing outcome in B2B transactions. • Business customers react asymmetrically to price increases and price decreases. • Salespeople have their own reference prices that influence the transaction price.
Faranda (2011)	A sample of 361 survey replies from organizational service buyers, who purchase employee injury compensation insurance from a large insurance carrier.	• Business buyers use a market-based reference price when evaluating commercial insurance services. • The effect was stronger in a competitive environment compared to a regulated one
Moosmayer et al. (2012)	Negotiation data from 282 business relationships of a German chemical supplier with customers in six client industries.	• Seller's reservation price, aspiration price, and initial price offering influenced the agreed price in negotiations explaining 86% of the variance in the negotiated settlement price. • Relatively, the seller's reservation price was a less important reference point compared to the aspiration price or the initial price offering.
Wilken et al. (2010)	Electronically mediated negotiations in an experimental setting with 119 student dyads (Study 1), and 41 dyads of key account managers.	• Providing sales people full cost information without information on direct cost, led to higher reference prices in terms of reservation price, target price, and first offer, contributing to higher sales prices.

Another study found that providing sales people undifferentiated cost information (full cost without information on direct cost), led to higher reference prices in terms of reservation price, target price, and first offer (Wilken, Cornelißen, Backhaus, & Schmitz, 2010). As this effect contributed to higher sales prices, the authors suggested that the results would be useful for managing sales people who have pricing authority.

For B2B transactions characterized by negotiated prices, another useful source of evidence for reference price effects comes from research in negotiation science. Briefly, there are some key findings providing evidence of reference price in negotiations. First, negotiators may be influenced by one or more of these reference prices: reservation price, aspiration price or initial price (see e.g., Carnevale & Pruitt, 1992; Galinsky & Mussweiler, 2001; Thompson, 1990).

Second, the concept of "reactive devaluation" referring to the fact that the very existence of a particular proposal or concession, especially if it comes from an adversary, may diminish its attractiveness in the eyes of the recipient (Ross, 1995). This means that the mere act of offering may set a reference point of an unacceptable price. Third, there is the broadly disseminated idea in cooperative negotiation literature that negotiation parties should seek "neutral", "objective" and "legitimate" reference points to elicit a sense of fairness towards the proposals on the table (Fisher, Ury, & Patton, 1991). This link between a reference point and feeling of fairness is well-aligned with price fairness research in marketing that shows that perceived fairness is based on a comparison between the focal price and a reference price (Xia, Monroe, & Cox, 2004). These findings from negotiation research provide evidence for the existence of reference prices in B2B transactions.

3.2. Price thresholds

3.2.1. Differential price thresholds

The concept of *differential price threshold* addresses the minimum increase in a *price difference* to induce a change in a buyer's perception of the relative expensiveness of the offering being evaluated (Monroe, 1973). It is not an issue of whether an individual notices that there is a numerical difference in a price relative to the reference price because a buyer may not even be able to articulate the exact price point of the reference price. What matters is not the numerical price "point" but the buyer's evaluation of the relative expensiveness of the offering. With the reference price as an anchor, a buyer judges the relative expensiveness of a price comparatively, that is ($P_{ref} - P_{actual}$). Whether the focal price P_{actual} is perceived more or less expensive than the reference price P_{ref} is an issue of whether a differential price threshold has been reached.

Even when a buyer notices that the focal numerical price differs from the reference price the buyer may not change buying behavior. That is, the buyer may purchase as previously, buy more, buy less or not buy at all. Of fundamental importance here are two types of differential price thresholds: *differential price perceptual threshold* and *differential price response threshold* (Cheng & Monroe, 2013). A buyer may recognize that a price differs from the reference price, but the price difference is not sufficient to induce a decision to buy, not buy, or purchase more or less. However, if the price difference is sufficiently larger, then a buyer may respond with an appropriate purchase decision. Whether a differential price response threshold is reached is a function of an individual buyer's sensitivity to price in the product/service category and is affected by all other existing external and internal cues.

This buyer adjustment to relatively small price increases has theoretical support both in assimilation–contrast theory as well as the concept of differential price threshold. With relatively small increments in price, buyers may not "perceive" that this price change has led to an increase in the relative expensiveness of the product. Even if they perceive that there has been an increase, it may not be large enough to reach their differential price response threshold and they would not alter their buying behavior. In this situation assimilation–contrast theory suggests that new increased prices are more likely to be "assimilated" when the increments are small than "contrasted" when the increments are larger.

Even when buyers *perceive* that a product's price differs from past exposure or expectation (differential price perceptual threshold), there remains a second question of whether this perceived price difference induces them to change their buying behavior (differential price response threshold). Unfortunately, little research has investigated this first question as it has been implicitly assumed that differences in prices are noticeable and that buyers respond accordingly. Lambert (1978) found that the sizes of perceived price differences increased as the products' reference price increased. Similarly, Uhl and Brown (1971) found that the size of differential price thresholds increased as reference prices increased. Kalwani and Yim (1992) suggested that there was a region of acceptable price differences around a buyer's reference price.

An important issue relative to the second question is whether there is a magnitude of price change or difference necessary to induce a significant change in purchase behavior? George, Mercer, and Wilson (1996) showed that responses to price changes for a household product varied across brands, the amount of the percentage price change, and the direction of the price change. However, to influence purchase behavior significantly, the price changes needed to be larger than 8–10%. An implication is that a differential price response threshold existed at this magnitude of price change. Also, between ±2% price change there was no noticeable change in purchase incidence.

One implication of the limited research on differential price thresholds is that within buyers' latitude of price indifference around their reference price demand for a product will be relatively inelastic, that is, the number of units sold changes very little if at all. Thus ± price changes that do not move the price to be outside this latitude of indifference will have little effect on demand. But, if the price increases to be *above* the buyers' upper absolute price thresholds or decreases to be *below* their lower absolute price thresholds then demand will become increasingly more price elastic as the price moves progressively away from the range of price acceptance (Monroe, 2003).

3.2.2. Absolute price thresholds and acceptable price range

At some *multiple* of differential price thresholds above the reference price, some buyers will find the product/service too expensive for consideration and stop purchasing (Bruno et al., 2012; Monroe, 2003). This is the *upper absolute price threshold*. Conversely, at a point where the price is so low that some buyers perceive it to be too low and become suspicious of its quality or validity, they would also stop purchasing. This is the *lower absolute price threshold*. Because these thresholds are points where buyers stop responding, they are multiples of differential price response thresholds. The upper and lower absolute price thresholds form the range of prices an individual buyer would consider purchase. This range is termed the *acceptable price range* (Monroe, 1968, 1971).

Individual buyers likely will have different absolute price thresholds for different products, and different buyers will have different absolute price thresholds for a specific product. In essence, for each person, a price is either acceptable or unacceptable. (Ofir (2004) did find a relatively small percentage of low-income consumers who did not exhibit an unwillingness to buy at very low prices.) Aggregating across buyers for a product category would produce a distribution of prices that are unacceptable as they are perceived to be too low and another distribution of prices that are unacceptable because they are perceived to be too high. Price elasticity estimates must consider both the absolute price thresholds as well as the differential price thresholds for a specific price change from a specific price point (Monroe, 2003).

It is possible that for a product category, there may be multiple price-market segments, each with a distribution of prices that are acceptable to pay and a low and a high absolute price threshold (Monroe, 1971). When multiple price-market segments exist, such estimations become even more complex. Each segment is characterized as having changing price elasticities at these specific low and high price thresholds (Han, Gupta, & Lehmann, 2001; Monroe, 1971; Pauwels, Srinivasan, & Franses, 2007; Terui & Dahana, 2006).

Differential price thresholds, absolute price thresholds and acceptable price range are measured from the reference price that acts as an anchor. A reference price is dynamic and subject to constant change. The various thresholds as well as the acceptable price range would also change depending on the reference price. It is important to note that a buyer can only perceive a difference in the relative expensiveness of an offering if a differential price perceptual threshold has been reached. Thus, the price points before reaching this perceptual threshold will not induce a noticeable difference to the buyer. This is precisely why a reference point is always manifested as a level.

At points above and below the reference price but within the differential price perceptual thresholds, a buyer does not distinguish the relative expensiveness of the offering. That is, between differential price perceptual thresholds or between a differential price perceptual threshold and the reference price, there is a range of prices falling in the *latitude of indifference* where a buyer cannot distinguish the relative expensiveness of the prices. For example, market research for a firm producing replacement lead-acid batteries for automobiles found that there was a "zone of indifference around … prices for most of its models. … [R]etail prices could be raised as much as 2 percent with virtually no loss of consumer choice for the … brand." (Baker, Marn, & Zawada, 2010, p. 295). The research enabled the company to finally convince their dealers and distributors to accept price increases that could be passed onto the consumer market. This example also illustrates that "BtoB customers are firms that have their own customers …

[whose] preferences are most likely the result of reference-dependent behavior of the industrial buyer" (Bruno et al., 2012, p. 641). Firms who sell indirectly to final users also need to know how their customers' buyers perceive and respond to price information (concept of derived demand).

As indicated above, behavioral price research has shown that buyers have differential price thresholds where varying relative expensiveness of an offering is detected. At some point above/below these thresholds, a price is judged to be too expensive for purchase or too inexpensive to be trusted for quality. These absolute price thresholds form an individual's acceptable price range for the offering.

3.2.3. Price thresholds in B2B

To date behavioral price research relative to price thresholds, whether differential or absolute, has been confined to consumers. To the best of our knowledge, there has been no research examining how business buyers perceive and judge price differences among competing sellers or offerings. Differences in prices for similar offerings do exist across sellers at a moment in time, within product lines, and over time for the same or different sellers. But how do business buyers judge these relative price differences? This question identifies an important gap in the B2B pricing research literature. It would seem to be an attractive opportunity for marketing researchers to extend current behavioral price research findings from consumer research to further our understanding of how prices and price information influence the judgments and choices of business buyers.

Although there are no specific studies on price thresholds or acceptable price range in the B2B domain, indirect evidence exists for the importance of these concepts. The term upper absolute price threshold has equivalent meaning as reservation price and willingness to pay. For example, in negotiation literature, reservation price has been shown to influence negotiator behavior (see e.g., White, Valley, Bazerman, Neale, & Peck, 1994). To the extent that business markets are based on negotiated prices suggests that the existence of absolute price thresholds is important. Also willingness to pay research (Hutton, 1997) indicates that an upper absolute price threshold exists. The existence of a lower absolute price threshold is linked to the price–perceived quality relationship. If price does signal quality then a lower absolute price threshold would indicate a price below which the quality is perceived to be inadequate by a buyer.

3.3. Price as a signal and cue of quality

3.3.1. Introduction to price as a signal and cue of quality

An actual price is presented to a buyer in symbolic form. The buyer brings this information to mind, encodes the price information, represents the price information in memory, perhaps cognitively processes this information (or processes it non-consciously) and forms a "perception" of the price or a perceived price. Research indicates that evaluation and choice are related but involve different mental processes (Hsee, Loewenstein, Blount, & Bazerman, 1999). Price influences product evaluations and choice. Evaluation refers to judgments of quality, whereas choice indicates a willingness to purchase a product at a specific price. Buyers do not have perfect information about product attributes and benefits nor are they perfect information processors. Under conditions of imperfect information, buyers may perceive price to be a signal of the qualities inherent in a product. The relationship between perceived price and perceived quality has received the most attention in behavioral price research (Somervuori, 2012).

Gabor and Granger (1966) and Monroe (1968) initially argued that price has a dual role: it serves to allocate resources and it provides information. That is, price serves both as an indicator of cost (sacrifice) and an indicator of quality. Buyers' perceptions of price influence their perceptions of quality that in turn influence perceptions of value. At the same time, buyers' perceptions of price influence their perceptions of the cost or sacrifice. A perception of value is partly the result of a mental tradeoff between what buyers perceive they receive compared to what they perceive they give up (Ariely, 2008; Hinterhuber, 2008; Monroe, 1979, 1990, 2003; Zeithaml, 1988; Zeng, Yang, Li, & Fam, 2011).

3.3.2. Price as a signal or cue of quality in B2B

Of the large number of studies that have examined whether price serves as a signal of perceived quality only a few studies have been conducted in the business-to-business domain (Table 2). White and Cundiff (1978) found no relationship between price and perceived quality. Despite efforts to address potential design issues in White and Cundiff's research, Lambert (1981) did not find a relationship between price and perceived quality. A decade later, Lockshin (1993) experimentally compared wine quality judgments between distributors and consumers. For consumers, price was a statistically significant cue of quality, both before and after tasting the wine. For distributors, however, quality perceptions were based on taste, and price did not have a statistically significant effect on quality perceptions.

Based on these three studies it is tempting to conclude that a price–perceived quality relationship does not exist in business-to-business contexts. This conclusion is consistent with consumer research showing that buyers are less likely to use price as a cue of quality when they are very familiar with the product, or when intrinsic quality information is available and they are able and motivated to process it (Rao & Monroe, 1988; Suri & Monroe, 2003). It is easy to associate many B2B buyers and buying situations with these characteristics. However, there are other types of B2B buying situations characterized by high levels of complexity, time pressure, or reduced motivation for routine purchases of low risk product groups. As heuristic processing of information is more likely in such situations, it seems plausible to expect that a price–perceived quality relationship would occur as more research is conducted. Others also doubt the conclusiveness of these few price–perceived quality studies, given the changes in the B2B market environment in recent years (e.g., Reid & Plank, 2000, p. 86).

This expectation is supported by empirical evidence of the price–perceived quality relationship in business-to-business marketing. Using data gathered from two business-to-business situations, Kumar and Grisaffe (2004) showed that extrinsic attributes such as price influenced perceived quality. Of interest here is this study extended prior research on the price–quality relationship to B2B transactions.

Table 2
Empirical studies on price as a cue of quality in B2B.

Study	Data and market type	Relevant findings
Kumar and Grisaffe (2004)	From two distinct business-to-business domains, one goods and one services. Telephone interview data consisted of 884 responses from retailer-customers of a financial services firm and 535 responses from office product supplier organizational customers.	• Price was statistically related to perceived quality.
Lambert (1981)	A purchase simulation survey of 108 purchasing agents (from various industries) for a dictation system.	• No relationship was found between price and perceived quality.
Lockshin (1993)	Experimental study on the wine quality perceptions of 100 wine wholesalers and 200 consumers.	• No relationship was found between price and perceived quality in the wholesaler sample (unlike in the consumer sample).
White and Cundiff (1978)	A purchase simulation survey sent to a sample of industrial buyers (from various industries), resulting in 196, 194, and 190 usable responses for the three products: industrial lift truck, a dictation system, and a metal working machine tool.	• No relationship was found between price and perceived quality.

Indeed, price was statistically related to perceived quality ($B = 0.11$; $p < 0.05$), leading the authors to conclude:

> Our results suggest that the moderate positive price–quality relationship observed in many previous studies also holds true in a business-to-business environment. The only explanation for this finding is that even in a business-to-business environment, where buyers are well versed with various suppliers and their price levels, buyers who find it difficult to assess quality may use price as a cue to gauge quality.
>
> [Kumar and Grisaffe (2004, p. 65–66)]

4. Price perceived value model

4.1. Concept of perceived value

Lilien et al. (2010, p. 297) suggest that "the essence of B2B marketing surrounds calculating, creating and claiming value." Although they do not identify pricing as an aspect of claiming value, price is the means by which firms capture a portion of the value that has been created for and with customers (Monroe, 2003; Silk, 2006). The terms value and price frequently are used synonymously as people mistakenly equate value with price. In 1738, Bernoulli first pointed out that value is unique to each individual and that value and price are independent (see also Anderson, Thomson, & Wynstra, 2000, p. 309; Lindgreen, Hingley, Grant, & Morgan, 2012, p. 208). Bernoulli wrote:

> [T]he determination of the *value* of an item must not be based on its *price*, but rather on the *utility* it yields. The price of the item is dependent only on the thing itself and is equal for everyone; the utility, however, is dependent on the particular circumstances of the person making the estimate.
>
> [Bernoulli (1954, p. 24, italics in original)]

In effect the key relevant concept is perceived value (Monroe, 1979; Ulaga & Chacour, 2001) and it varies across buyers depending on the perceived utility the product or service in question provides.

In any particular purchase, buyers are seeking to acquire benefits. Within a business-to-business context, the benefit component of value includes some combination of physical attributes, service attributes, and technical support available relative to the particular use of the product, the purchase price, other seller-offered purchase incentives and other signals of perceived quality (Zeithaml, 1988; Zeng et al., 2011). Perceived sacrifices include the total cost to the buyer: purchase price, startup costs (acquisition costs, transportation, installation, order handling), and post-purchase costs such as repairs and maintenance and risk of failure or poor performance as well as any financing costs.

4.2. Decomposing perceived value

As suggested by Bernoulli, value must be considered from the perspective of the customers who acquire and use the product or service. In the price–perceived value model the overall perceived value of a product being considered for purchase is its (1) *perceived purchase value* (or acquisition value) (the expected benefits to be gained from acquiring and using the product less the net displeasure of paying for it), and (2) *perceived offer value* (or transaction value) (the buyers' perceptions of (dis)satisfaction obtained from the price paid compared to a (lower) higher reference price) (Bruno et al., 2012; Grewal et al., 1998; Thaler, 1985).

4.2.1. The first component: perceived purchase value

In a purchase transaction, a buyer gains a product (in the broad meaning of the term, including also services) but gives up (loses) the money paid and other purchasing efforts expended for the product. To explain the role of price, three behavioral price concepts are relevant. The *perceived benefit* of the product is conceptualized to be equivalent to the utility inherent in the *maximum price* (P_{max}) a customer would be willing to pay for the product (upper acceptable price threshold). *Perceived purchase value* of the product is the monetary equivalent of the perceived benefits inherent in the product at this maximum price compared to the *perceived actual selling price* ($P_{max} - P_{actual}$). *Perceived offer value* occurs when buyers compare their *reference price* to the perceived actual selling price ($P_{ref} - P_{actual}$). Perceived value is a weighted integration of these two value concepts (Bruno et al., 2012; Monroe, 2003; Thaler, 1985):

$$PV = v_1(P_{max} - P_{actual}) + v_2(P_{ref} - P_{actual}), \quad (1)$$

where v_1 and v_2 represent different subjective weights placed by buyers on the two components of perceived value, $0 \le v_i \le 1$, $\Sigma v_i = 1$. When the purchase goal is to acquire a specific product solution, it is likely that $v_1 > v_2$. But, if the goal is to pay less or avoid paying more, then it is likely that $v_1 < v_2$ (Krishnamurthi, Mazumdar, & Raj, 1992).

Buyers' perceptions of purchase value represent the difference between the benefits they perceive in the product and the sacrifice they perceive necessary to acquire and use the product or service. Within a buyer's acceptable price range, the perceived benefit in the product is larger than the perceived sacrifice, and the buyer will judge that there is positive perceived purchase value in the product (Suri & Monroe, 2003). Willingness to buy would be positively related to perceived purchase value.

4.2.2. The second component: perceived offer value

Whether buyers are satisfied or not with the terms of the transaction, price in particular, leads to perceptions of offer value. Paying a perceived price less than their reference price has positive value (gain), possibly inducing a favorable response. Buyers may be dissatisfied when the perceived price is more than their reference price. In such a situation, the extra amount that they would pay relative to their reference price could be perceived as negative value (loss). If buyers are more sensitive to losses than to gains (Bernoulli, 1954; Kahneman & Tversky, 1979) relative to a specific reference point, *then for the same amount of absolute price difference between a buyer's reference price and a perceived selling price, a negative perceived offer value would be larger in magnitude than a positive perceived offer value*. It has been shown that positive perceived offer value augments buyers' perceived purchase value (Grewal et al., 1998).

This price–perceived value model is influenced by the dual roles of a price. Both perceived quality and perceived monetary and non-monetary sacrifice mediate the relationship between perceived price and perceived value. In particular, buyers' knowledge of the product and of actual price–quality relationships in a market moderates the degree that they may use price to infer product quality. Hence, the extent they believe that there is a price–quality relationship will influence their value perceptions and willingness to buy (Lichtenstein & Burton, 1989; Peterson & Wilson, 1985; Völckner, 2008).

4.3. Price–perceived value in B2B

The business-to-business marketing literature includes considerable research on value creation and value delivery. Sheth, Newman, and Gross (1991) identified five dimensions of perceived value: social, emotional, functional, epistemic, and conditional. Testing the Sheth et al. model in industrial clusters Fiol, Tena, and García (2011) concluded that perceived value in B2B markets is a multidimensional construct with three dimensions: functional, social, and emotional. "In sum, the concept of value in business markets is perceptual in nature …." (Anderson, Jain, & Chintagunta, 1993, p. 5).

Offering a different conceptualization of perceived value, Hinterhuber (2008) expanding Ulaga (2003) and Ulaga and Eggert (2006), suggested

that value in B2B markets is: 1) a subjective component, 2) a trade-off between benefits and sacrifices, 3) multidimensional, 4) relative to competitors, 5) segment specific, and 6) future oriented. Moreover, six benefit dimensions were identified: product quality, delivery performance, service support, personal interaction, supplier know-how, and time to market. A sacrifice component was subdivided into direct costs, acquisition costs, and operation costs. Table 3 summarizes the findings of the above empirical studies.

Based on the above evidence perceived value is an important construct in B2B markets. However, the perceived value conceptualizations in the B2B literature have concentrated solely on perceived purchase value evaluation. The traditional view holds that perceived value is based on functional criteria including a trade-off between perceived benefits and sacrifices (Anderson et al., 2000).

However, as discussed earlier, B2B buyers do use reference prices in their price evaluations (Bruno et al., 2012). For example, the reference price in a B2B market has been found to be related to strength of competition (Faranda, 2011), seller's reservation price, aspiration price, and initial price offering (Moosmayer et al., 2012). Furthermore, the negotiation literature supports the relevance of reference points. There is evidence that perceived offer value is an important component of B2B perceived value evaluation. Indeed the reference price effect is a necessary and sufficient condition for perceived offer evaluations.

Also the empirical research on perceived value in a B2B context identifies that value is defined relative to competition and is subjective (Ulaga, 2003; Ulaga & Eggert, 2006). However, this perspective may be too narrow. Instead, perceived value should be seen relative to the buyer's reference price. Therefore, the effect of perceived offer value on buyers' evaluations and choices should not be ignored in B2B marketing.

Table 3
Empirical studies on conceptualization of perceived value.

Study	Data and market type	Conceptualization of perceived value
Anderson et al. (2000)	Survey of 288 members of the National Association of Purchasing Management (NAPM)	• Purchasing managers have separate functions for value and price, even when they are monetarily equivalent
Fiol et al. (2011)	A cluster of Spanish ceramic tile manufacturers — purchasing main supplies	Elements of perceived value are: • Functional: price, convenience, cost of change, product quality, employee's service quality, firm's service quality • Emotional: social image, reputation • Social: experience, personalized treatment, interpersonal relationship
Hinterhuber (2008)	Theory-based, test of model in a series of workshops with 35 executives working in four separate industrial marketing environments	Customer value includes six elements: Product; delivery capabilities; services; ease of doing business; vendor; self enhancement
Ulaga (2003)	Nine in-depth interviews of purchasing managers	Eight value drivers: Product quality; service support; delivery; time-to-market; supplier knowledge; personal interaction; price; process cost
Ulaga and Eggert (2006)	10 in-depth interviews of key decision makers in the company purchasing department	Key value drivers: Benefits: Product quality; delivery performance; service support; personal interaction; supplier knowledge; time-to-market Costs: Direct costs; acquisition costs; operation costs

Traditionally, research has assumed that B2B buyers are "rational". Recent research, however, questions the rationality assumption (e.g., Fiol et al., 2011; Sherlock, 1991, 1992). For example, the emotional and social cues are especially present in the construction of reference prices (Adaval & Monroe, 2002) and thus they are relevant for the perception of offer value as well.

5. Discussion

In this paper, we have proposed that many behavioral price concepts developed in the past B2C price perception research may be applicable in B2B context as well. The objective of this paper was to test this proposition through analyzing the existing evidence on the five important behavioral price concepts: reference price, price thresholds, acceptable price range, price as an indicator of quality, and the price–perceived value model. Specifically, we assessed whether these concepts apply to setting and managing prices in business-to-business markets based on previous research. These concepts are fundamental to develop an understanding of how and why people respond to prices and price information. Since organizations consist of individuals, many behavioral characteristics in judgment and decision-making are present across diverse contexts (e.g., Helson, 1964; Kahneman & Tversky, 1979; Simon, 1955; Stanovich, 2010) and thus apparent in B2B as well (e.g., Wilson, 2000).

5.1. Contributions

This paper has several key contributions. First, we identify previous behavioral price research that is specific to a B2B context. Unfortunately such research is sparse, and for some concepts virtually non-existent. Second, we review existing B2B evidence for these fundamental behavioral price concepts. Third, to lay the foundation for more specific research and analyses, we have summarized the essence of these fundamental concepts from previous behavioral price research. Our key conclusions are presented next.

A reference price is a dynamic, internal price to which an individual compares the offered price of a product or service (Cheng & Monroe, 2013). A few innovative studies have examined the reference price concept in a business-to-business setting (Bruno et al., 2012; Faranda, 2011; Moosmayer et al., 2012; Wilken et al., 2010). Based on the results from these studies we conclude that the reference price effect exists in B2B markets. This effect is characterized, in particular, by the comparisons that emerge from negotiated prices. In many respects, this conclusion should not be surprising as it reflects a basic finding from behavioral research on how humans make decisions (Ariely, 2008).

Price thresholds and acceptable price range stem from sensory and perceptual psychology and were introduced to pricing by Monroe (1973). The differential price threshold addresses the minimum increase in a price difference necessary to induce a change in a buyer's perception of the relative expensiveness of a product or service being evaluated. The upper absolute price threshold is the point where buyers will find the product too expensive for consideration and stop purchasing. Conversely, the lower absolute price threshold is where the price is so low that some buyers become suspicious of the product's quality or validity, and they stop purchasing (Cheng & Monroe, 2013; Monroe, 1973, 2003). Although no B2B studies have yet been done, there is indirect evidence on the importance of these concepts in B2B (Hutton, 1997; White et al., 1994).

The role of price as a signal or cue of quality has received considerable research attention since Leavitt (1954) examined the use of price in assessing product quality. Surprisingly few studies can be found in the B2B area (Kumar & Grisaffe, 2004; Lambert, 1981; Lockshin, 1993; White & Cundiff, 1978). Based on the existing evidence, we argue that price may also act as a signal or cue of quality in B2B markets, although the effect may be attenuated, probably, by the expertise of the purchasing organization.

The above constructs are the core concepts of behavioral price research and they provide the foundation for the perceived-value pricing model. In the price–perceived value model the overall perceived value of a product being considered for purchase is determined by its perceived purchase value and perceived offer value (Bruno et al., 2012; Grewal et al., 1998; Thaler, 1985). Perceived purchase value derives from the expected benefits to be gained from acquiring and using a product less the net displeasure of paying for it. Perceived offer value comes from the buyers' perceptions of (dis)satisfaction obtained from the price paid compared to a (lower) higher reference price.

Based on the evidence reviewed, perceived value is an important construct also in business markets (Anderson, Narus, & Narayandas, 2009; Lilien et al., 2010). Although the price–perceived value model is widely applied in B2B pricing, it is often used in its narrow form without explicitly considering the perceived offer value. We argue that perceived value judgments in B2B should not be based only on functional evaluation of perceived purchase value, a common practice, but it should also include perceived offer value evaluation.

5.2. Managerial implications

Behavioral price research provides a fundamental understanding of how customers perceive, process, store and use price information. Drawing on research and thinking stemming back to the 1700s and 1800s and integrating research from the past half century we have learned much about how people respond to numerical stimuli as individuals and in groups. Simply, the basic assumptions of neoclassical microeconomic theory do not reflect how people actually do respond to price information. By recognizing and drawing on advances made in consumer behavioral price research pricing managers in business-to-business markets will obtain:

- A better understanding of their customers' processing of price information and behaviors.
- Improved capability in estimating how customers will respond to different pricing initiatives.
- Support for planning, scheduling and communicating price and promotion decisions.
- Knowledge on how and when to schedule and implement price changes.

Similarly, purchasing managers and committees will be more aware of how price information is processed and how price may be a signal of quality, and be more cognizant of decision biases and decision making traps (Sherlock, 1992), leading them to:

- Search and take advantage of more versatile reference prices.
- Manage more systematically the acceptable price range and thresholds within it.
- Avoid possible biases due to price's role as a cue of quality.
- Appropriately assess the relative importance between perceived purchase and offer value in price–perceived value evaluation.

5.3. Limitations and future research

Our findings demonstrated that while there has been some behavioral price research in a B2B context, nevertheless it is comparatively sparse, and for some concepts virtually non-existent. While this is a valuable result in itself, it is also a limitation in our study preventing conclusive inferences, thus making our findings indicative at this stage. The entire B2B behavioral price research is at its infancy and a stronger research base is needed for conclusive statements.

More broadly, the lack of B2B research on price thresholds and perceived offer value reflects the fact that the entire B2B behavioral price research is an emerging research domain. However, as B2B price research grows in volume, studies on price thresholds and perceived offer value likely will emerge, as these constructs have been useful in conceptualizing consumers' responses to price information. This expectation is also supported by the similar delayed pattern of research activity that has occurred on other key behavioral price research concepts, such as reference price, which has begun to emerge recently.

In this paper, we have commenced a conversation on the importance of behavioral implications for pricing management in business-to-business marketing. Much more work is yet to be done but a foundation has been set in our understanding of buyer responses to price and pricing information. Future research in pricing management for business-to-business marketing should develop ways to measure buyers' reference prices, understand buyers' sensitivity to price changes and price differences by estimating differential price thresholds and buyers' upper and lower absolute price thresholds, further assess the role of price as a signal or cue of quality, and effectively test the perceived value model. Our paper has demonstrated that in this work the past conceptualizations and findings from B2C behavioral price research can serve as a useful and important basis.

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Pricing superheroes: How a confident sales team can influence firm performance

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ABSTRACT

Despite strong evidence of substantial impact on the bottom line, most companies counter-intuitively neglect the pricing function — as do most scholars. Although pricing is gaining in popularity, only a few articles published in major marketing journals focus on it, and scholars have long asked how organizational and behavioral characteristics of firms affect the link between pricing practices and firm performance. To address these practical and theoretical deficits, we surveyed 507 professionals involved in account and sales management at business-to-business (B2B) firms from around the world to measure the influence of five organizational factors on sales collective confidence associated with pricing and relative firm performance. Results demonstrate that four of the five factors (pricing capabilities, delegation of pricing authority, incentive and goal systems, and knowledge before negotiation) positively and significantly influence sales collective confidence associated with pricing. In turn, we find collective confidence in the sales force to be significantly and positively related to relative firm performance, suggesting that firms that are able to design organizations and allocate resources in a way that maximizes pricing confidence can achieve superior financial outcomes. In aggregate, these organizational factors promote competitive advantage and comparative firm performance.

1. Introduction

Numerous studies contend that pricing has a substantial and immediate effect on company profitability: small variations in price influence the bottom line by as much as 20% to 50% in both directions (Hinterhuber, 2004; Nagle & Holden, 2002). Pricing can have a significant impact on the profit performance of firms when managed with strategic intention (Liozu & Hinterhuber, 2013a).

But pricing is also a complex function for organizations to manage (Dolan & Simon, 1996; Lancioni, Schau, & Smith, 2005) and to operationalize, especially in the area of pricing execution when the sales force faces customers in the marketplace (Anderson, Kumar, & Narus, 2007). The publications related to the adoption of progressive pricing approaches by commercial teams point to difficulties in making customer value assessments (Hinterhuber, 2008a), to the complexity of value assessment tools available to the sales force (Anderson, Jain, & Chintagunta, 1993), to interdepartmental conflicts between sales, marketing, and finance (Lancioni et al., 2005), to the increased reluctance of purchasing managers to accept higher-priced offerings (Anderson, Wouters, & van Rossum, 2010), and to increased competitive intensity of markets (Ingenbleek, Debruyne, Frambach, & Verhallen, 2001) as impediments.

Historically, pricing has received little attention from either practitioners or marketing scholars (Hinterhuber, 2004, 2008a; Malhotra, 1996; Noble & Gruca, 1999). A review of 53 empirical pricing studies concluded that pricing literature is highly descriptive and fragmented and that theoretical understanding of firm pricing decisions is limited (Ingenbleek, 2007). While recent pricing papers have highlighted the topics of pricing delegation (Frenzen, Hansen, Krafft, Mantrala, & Schmidt, 2010), pricing championing by top executives (Liozu & Hinterhuber, 2013c) and the organization of the pricing function (Homburg, Jensen, & Hahn, 2012; Liozu & Ecker, 2012), the focus of B2B pricing-related literature has moved towards the concepts of value creation and value capture in B2B market (Aspara & Tikkanen, 2013; Simmons, Palmer, & Truong, 2013), as well as the pricing of service (Indounas, 2009; Indounas & Avlonitis, 2011; Toncar, Alon, & Misati, 2010). Specific pricing literature remains scarce (Leone, Robinson, Bragge, & Somervuori, 2012) and is still relatively silent about how organizational and behavioral characteristics of firms may affect pricing execution and pricing effectiveness of the sales force. More specifically, no study directly investigates the construct of collective confidence in pricing from a sales-force perspective or the relationship between sales-force collective confidence in pricing and firm performance. To address this deficit, and supported by the results of a qualitative inquiry with 44 managers in 15 B2B firms in the United States (Liozu, 2013), we surveyed 507 account and commercial management professionals and leaders involved in managing pricing activities for their B2B organization.

Our survey objectives are to

- examine the drivers of sales collective confidence for pricing and its impact on perceived firm performance.

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- create a bridge between the fields of pricing and organizational behavior by linking three critical factors — pricing capabilities, knowledge prior to pricing negotiation, and collective confidence associated with pricing — to relative firm performance.
- highlight that the purposeful design of organizational programs to boost the pricing confidence of account management teams may have a strong and positive impact on perceived firm performance.

2. Theoretical background and hypotheses

The development of our theoretical model draws from related streams of literature: industrial pricing, the resource-based view (RBV) of the firm, and organizational theory, particularly the literature on social cognitive theory, organizational structure, and incentive and goal systems. Pricing is a multi-disciplinary function, and we position our research paper at the nexus of three critical concepts: B2B pricing, collective confidence of commercial teams, and firm performance. The selection of variables constituting our hypothesized research model is shown in Fig. 1, which was guided by a qualitative inquiry conducted in 2011 (Liozu, Boland, Hinterhuber, & Perelli, 2011), by our literature review, and our extensive commercial practical experience. The model hypothesized that five variables act as potential antecedents of the collective confidence of commercial teams with regard to pricing. In other words, these five dependent variables play a critical role in the development of the level of perceived confidence as a team to deploy and execute pricing programs and actions. Additionally, our model hypothesizes a positive and significant relationship between sales collective confidence and relative firm performance. Finally, we posit that these relationships will vary based on the primary pricing orientation adopted by their firms (cost, competition, or customer value). Controls are linked to the two independent variables to evaluate their effects on the overall model.

2.1. Capabilities and resource-based view of the firm

The RBV of the firm is a well established theoretical perspective in strategic management that explains the performance of organizations in terms of internal assets, resources, and capabilities. It explains and predicts why some firms are able to establish positions of sustainable competitive advantage leading to superior returns or economic rents, and it perceives the firm as a "unique bundle of resources and capabilities where the primary task of management is to maximize value" (Grant, 1996:110). Resources are generally rare, inimitable, and non-substitutable firm-specific assets that add value to firms' operations by enabling firms to implement strategies that improve efficiency and effectiveness (Barney, 1991). In contrast, capabilities refer to firms' abilities to perform a coordinated set of tasks, utilizing internal resources, to achieve desired outcomes (Helfat & Peteraf, 2003). Amit and Schoemaker (1993) split this general construct into two distinct concepts – resources and capabilities – defining the former as tradable and non-specific firm assets and the latter as non-tradable, firm-specific abilities to integrate, deploy, and utilize other resources within the firm. In this sense, resources are the inputs of production processes, whereas capabilities refer to the capacity to deploy resources using organization processes (Amit & Schoemaker, 1993). Capabilities are often developed in strategic, functional, and sub-functional areas by combining physical, human, and technological resources (Amit & Schoemaker, 1993). Although there is no predetermined functional relationship between a firm's resources and its capabilities (Grant, 1991), Makadok (2001) made a useful distinction: a resource is an observable but not necessarily tangible asset that can be independently valued and traded, whereas a capability is unobservable and hence necessarily intangible, cannot be independently valued, and changes hands only as part of its entire unit. Makadok (2001) further suggested that economic rents are created when firms are more effective than their rivals in selecting and deploying resources to build capabilities, and that resource-picking and capability-building are not necessarily independent but are complementary activities. The key characteristic of capability which separates it from resource is its organizational embeddedness, which suggests that capability cannot easily be bought from the external factor market, is embedded within the organization, and must be built or cultivated over time. Although resources by themselves can serve as a basic unit of analysis, firms build capabilities by assembling these resources into unique configurations, thereby transforming inputs

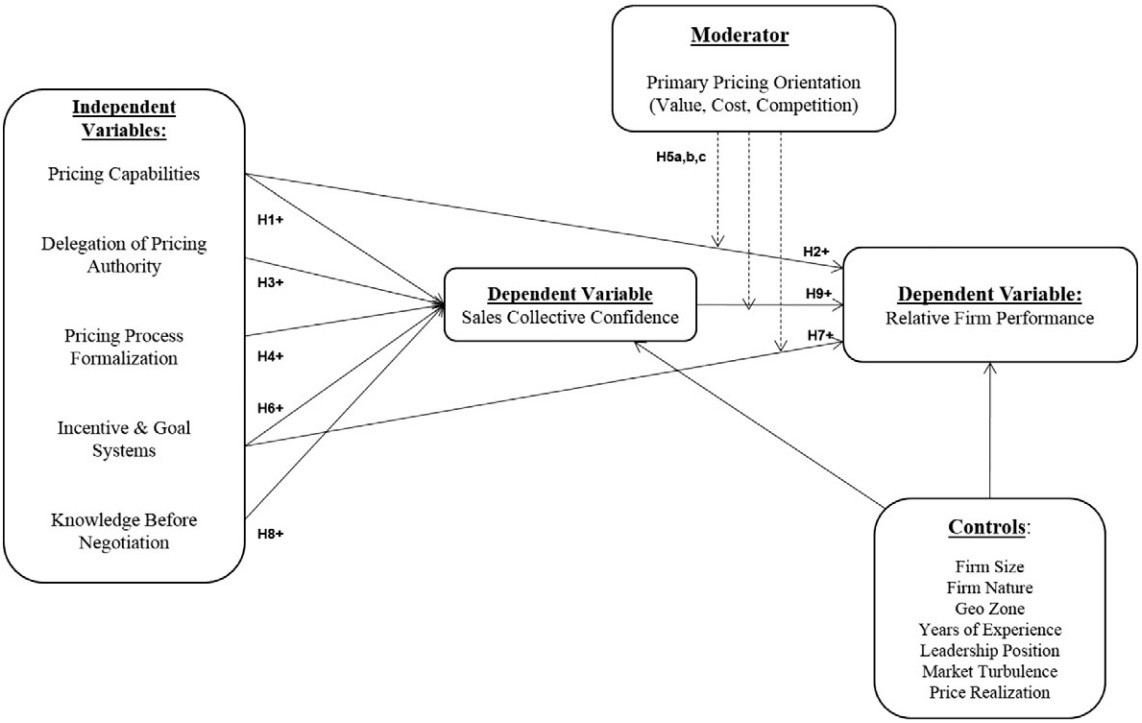

Fig. 1. Hypothesized research model.

into outputs of greater worth (Amit & Schoemaker, 1993). Capability-building refers to the ability of firms to build unique competencies that can leverage their resources (Teece, Pisano, & Shuen, 1997). Firms derive their competitive strengths from their "small number of capability clusters" (Dosi, Nelson, & Winter, 2000:125). Because organizations face increased complexity, they need to constantly reevaluate and repackage the required set of capabilities (Cohen & Levinthal, 1990), making them dynamic (Teece et al., 1997).

Dutta, Zbaracki, and Bergen (2003) published a seminal paper demonstrating the role of pricing capabilities, defined as a set of complex routines, skills, systems, know-how, coordination systems, and complementary assets, in increasing the performance of organizations. Pricing capability covers multiple dimensions: first, the internal price-setting capability (identifying competitor prices, setting pricing strategy, translating from pricing strategy to price); second, the price-setting capability when strategies and tactics are brought to market and to customers (convincing customers on price-change logic, negotiating price changes with major customers).

Previous studies on pricing capabilities found them to be positively related to firm performance (Berggren & Eek, 2007; Dutta, Bergen, Levy, Ritson, & Zbaracki, 2002; Dutta et al., 2003; Hallberg, 2008; Liozu & Hinterhuber, 2013a). Many organizations with a center-led team of pricing experts focus on diffusing pricing knowledge and capabilities across the organization and more specifically to commercial teams (Liozu et al., 2011). By doing so they contribute to the building of collective confidence and the sense of collective capability in the sales organization to execute pricing programs. When faced with a pricing decision or with the need to price a new product or service, decision makers do not have the luxury of choosing between a rational, analytic approach and an intuitive, emotional approach. They need to have the capabilities to reach a greater level of decision effectiveness and decision confidence (Dane & Pratt, 2007; Simon, 1987). This "balancing act" conducted by pricing experts can help decision makers narrow the decision range, create confidence in pricing activities, and remove uncertainty and ambiguity from the price-setting process.

Accordingly, we conjecture the following:

H1. Pricing capabilities have a positive effect on sales collective confidence when controlling for firm size, firm nature, firm geographical zone, respondent's years of experience, leadership position, market turbulences, and price realization.

The development of unique strategic pricing and selling capabilities and the deployment of strategic resources to grow these capabilities can lead to superior pricing decisions, greater organizational capital, and greater competitive advantage in the marketplace (Dutta et al., 2002). Firms with well-defined pricing practices using advanced pricing methods have a greater capacity to design and implement structured pricing training programs and to design pricing tools to assist in the decision-making process. The presence and development of these pricing capabilities, whether formal or informal (Dutta et al., 2003), generate greater collective confidence in pricing programs, decision-making rationality, and business performance when combined with other commercial capabilities (Vorhies & Morgan, 2005). Although the pricing and marketing literatures have not fully addressed the specific relationship between pricing capabilities and firm performance, some evidence in recently published papers point to a strong and positive relationship (Liozu & Hinterhuber, 2013a).

H2. Pricing capabilities have a positive effect on relative firm performance when controlling for firm size, firm nature, firm geographical zone, respondent's years of experience, leadership position, market turbulences, and price realization.

2.2. Organizational theory and the pricing function

Our work is guided by organization theory, which we take to include the internal structure of a firm and the relationships between its units and departments (Grant, 1996), as well as the flow of information within organizations that supports and influences decision-making processes (March, 1994, 1999; Simon, 1961). A critical question is how pricing decisions occur in organizations and what organizational factors influence processes and managerial judgment when decisions are made (Hinterhuber & Liozu, 2012; Ingenbleek, 2007; Ingenbleek & van der Lans, 2013). Previous work by leading behavioral and social researchers has covered many important aspects of organization theory. Below, we focus on the most relevant ones, including formalization as part of the organizational structure construct (Aiken, Bacharach, & French, 1980; Hall, 1977; Hall, Johnson, & Haas, 1967; Miller, Droge, & Toulouse, 1988), delegation of pricing authority (Frenzen et al., 2010), and firm orientation in pricing (Hinterhuber & Liozu, 2012; Ingenbleek, Frambach, & Verhallen, 2010).

2.2.1. Delegation of pricing authority

The question of the level of delegation of pricing authority to the sales organization is still ongoing. The question of delegation of pricing authority can be influenced by impactful exogenous factors (Homburg et al., 2012; Joseph, 2001). Like the centralization question of pricing, whether to delegate decision-making authority to the sales force is a difficult and emotional question that can have dire consequences if not managed well. The topic remains grossly under-researched. The sales function claims they hold the tactical knowledge of pricing and should be the one making final decisions (Lancioni et al., 2005). Top management and the finance function think the sales force should not hold the final responsibility for pricing under any conditions (Liozu et al., 2011). Under conditions of intense competition, firms prefer price delegation because prices set by their sales personnel are higher (Bhardwaj, 2001). In contrast to earlier literature (Stephenson, Cron, & Frazier, 1979), recent empirical work has identified a positive relationship between delegation of pricing authority and business unit performance (Frenzen et al., 2010). Further, delegating pricing authority can increase sales personnel motivation (Yuksel & Sutton-Brady, 2006). We hypothesize that a delegation of controlled authority to the sales force will positively influence their pricing confidence. The sales force cannot be perceived as having no authority in front of the customer, as this would greatly demotivate them and reduce their collective self-esteem (Bohn, 2001).

A recent qualitative inquiry revealed various degrees of authority levels associated with pricing and varying degree of formalization in the approval processes (Liozu, 2013). All firms interviewed did allow their sales personnel to have a certain "room to maneuver" when faced with pricing pressure in order to maintain face in front of customers and remain confident about their capabilities. Accordingly, we conjecture the following:

H3. Delegation of pricing authority has a positive effect on sales collective confidence when controlling for firm size, firm nature, firm geographical zone, respondent's years of experience, leadership position, market turbulences, and price realization.

2.2.2. Pricing-process formalization

Organizational structure, which can be variously defined and take myriad forms, relates to dimensions that cannot be reduced to or deduced from properties of the organization's members (Aiken et al., 1980). Several reviews (Hall, 1977; John & Martin, 1984; Miller et al., 1988) have suggested that complexity (structural differentiation), formalization, and centralization are the most common and consistent characteristics of structure. For this paper, we focus on formalization and explore how the degree to which a firm is formalized signals the

perceived capabilities of its members in exercising judgment and self-control (Hall, 1977:95). Formalization involves control to ensure that members follow defined and standardized rules, roles, and procedures (Hage & Aiken, 1967; Hall, 1977; Hall et al., 1967) as well as instructions and communications (Pugh et al., 1963). We define formalization as an emphasis on following defined or standardized rules, roles, and procedures in conducting firm activities, making decisions, and implementing processes in a formalized way. The notion of control and routinization associated with process formalization has a negative connotation. However, we take the opposite position: well-documented, structured, and communicated rules, procedures, and instructions for firm activities, including those related to pricing, might increase the level of organizational commitment and confidence in executing these activities as well as provide a strong message about top leadership commitment (Workman, Homburg, & Jensen, 2003). Top management should avoid over- or under-specification of the formalized process that could lead to negative organizational consequences (Hall, 1977:112).

Therefore, it seems reasonable that pricing-process formalization positively reinforces the level of collective confidence, as it creates a structure for account and sales management professionals within which they can receive clear guidelines, objectives, and methods (Liozu et al., 2011). We posit that pricing-process formalization is required to a certain extent to give pricing decision makers a framework within which to operate.

H4. Pricing-process formalization has a positive effect on sales collective confidence when controlling for firm size, firm nature, firm geographical zone, respondent's years of experience, leadership position, market turbulences, and price realization.

2.2.3. Primary pricing orientation

Prior research uncovered stark contrasts between firms using the three pricing orientations (Hinterhuber, 2008b; Liozu & Hinterhuber, 2013a). Firms organized differently developed pricing capabilities varying in nature, intensity, and extent of collective confidence associated with pricing (Ingenbleek & van der Lans, 2013; Liozu et al., 2011). Therefore, we hypothesize that the "primary" pricing orientation adopted by the firms comprised in our sample will moderate the relationship between pricing capabilities and relative firm performance, between sales collective confidence and relative firm performance, and between incentive and goal systems and relative firm performance. Specifically, we postulate that firms using value-based pricing will exhibit higher levels of pricing capabilities (Liozu & Hinterhuber, 2013a), superior levels of collective confidence (Liozu et al., 2011), and incentives and goals systems geared towards profit and value creation (Anderson et al., 2007; Hinterhuber, 2008a).

H5a. Primary pricing orientation positively moderates the relationship between pricing capabilities and relative firm performance such that the relationship will be stronger for firms using value-based pricing than for firms using cost-based or competition-based pricing, when controlling for firm size, firm nature, firm geographical zone, respondent's years of experience, leadership position, market turbulences, and price realization.

H5b. Primary pricing orientation positively moderates the relationship between sales collective confidence and relative firm performance such that the relationship will be stronger for firms using value-based pricing than for firms using cost-based or competition-based pricing, when controlling for firm size, firm nature, firm geographical zone, respondent's years of experience, leadership position, market turbulences, and price realization.

H5c. Primary pricing orientation positively moderates the relationship between incentives and goals systems and relative firm performance such that the relationship will be stronger for firms using value-based pricing than for firms using cost-based or competition-based pricing, when controlling for firm size, firm nature, firm geographical zone, respondent's years of experience, leadership position, market turbulences, and price realization.

2.3. Incentive and goal systems

Alignment of sales incentives prevents organizational conflicts and potential breakdowns in the pursuit of organizational goals (Hinterhuber, 2008a; Kerr, 1975). "Rewarding A while hoping for B" (Kerr, 1975:1) generates inadequate incentive structures and a potential failure of collaboration in the firm (Barnard & Andrews, 1968:139). Reward systems designed by management can serve either to "sharpen or to blunt their decisive effectiveness" (Walton & Dutton, 1969:75). Literature on pricing, and specifically on the adoption of value-based pricing, suggests that reward systems based on profitability need to be implemented across multiple departments of the firm (Hinterhuber, 2004, 2008a) to gain alignment across these departments and buy-in from sales organizations to embark on a value-selling transformation (Anderson et al., 2007). Performance-oriented goals – such as revenue, margin, or new customer acquisition targets – exercise a positive effect on sales personnel performance (Kohli, Shervani, & Challagalla, 1998; Weinberg, 1975). Sales personnel with a high-performance goal orientation attribute success largely, if not exclusively, to their ability (Silver, Dwyer, & Alford, 2006). Other findings also indicate that sales incentives are critical to successful pricing transformation (Liozu et al., 2011).

Sales incentives are critical to successful pricing transformation (Liozu, 2013). It is essential for sales and account management to be rewarded based on appropriate performance criteria and also to have "skin in the game" (Liozu & Hinterhuber, 2013b), as one respondent mentioned.

Therefore, supported by previous research on sales compensation (Homburg et al., 2012; Weinberg, 1975), we conjecture that well-aligned performance-oriented goals and incentives have two effects: on the one hand, they positively influence firm performance; on the other hand, they positively influence sales and account managers' collective confidence to manage pricing programs and reach pricing goals.

H6. Incentives and goal system have a positive effect on sales collective confidence when controlling for firm size, firm nature, firm geographical zone, respondent's years of experience, leadership position, market turbulences, and price realization.

H7. Incentives and goal systems have a positive effect on relative firm performance when controlling for firm size, firm nature, firm geographical zone, respondent's years of experience, leadership position, market turbulences, and price realization.

2.4. Knowledge before negotiation

Individuals differ widely in their negotiation abilities (Elfenbein, Curhan, Eisenkraft, Shirako, & Baccaro, 2008). A recent qualitative study showed that 4 of 15 firms in the sample conducted specific pricing and negotiation training with their sales force (Liozu et al., 2011) to improve the outcome of customer transactional interactions. Included in these training programs were critical dimensions related to the understanding of customer value elements prior to negotiation (such as incumbent's price, value position, and differential economic value). Selling on and negotiating for value is a process that requires preparation, chess-playing skills, and a capacity to outmaneuver the other side (Anderson et al., 2007). To achieve great results in negotiation and value selling, the seller must have a game plan and prepare a strategic playbook (Reilly, 2010b). That playbook needs to be ready and tested

long before the parties enter into price negotiations. Good preparation for negotiation should include the understanding of customers' negotiation tricks and traps (Holden, 2012), the knowledge of customers' prior buying and negotiation behaviors (Steinmetz & Brooks, 2010), the anticipation of standard pricing objections (Reilly, 2010a), and pushback the buyers will give on value estimation and the seller's value messages (Fox & Gregory, 2004). Supported by extant literature indicating that an individual's performance in negotiations is affected by his or her knowledge and level of preparation (Sebenius, 2001; Zoubir, 2003), we hypothesize the following:

H8. Knowledge before pricing negotiation has a positive effect on sales collective confidence when controlling for firm size, firm nature, firm geographical zone, respondent's years of experience, leadership position, market turbulences, and price realization.

2.5. Social cognitive theory

2.5.1. Self-efficacy

Social cognitive theory (Bandura, 1997) suggests that there are two main perceptions leading to an organization member's motivation to engage in teamwork activities and behaviors. These are related to the "individual's perception of his or her ability to perform generic teamwork behavior (self-efficacy) and perceptions regarding the team's possession of the resources required for completing the task (collective efficacy)" (Tasa, Taggar, & Seijts, 2007:3). Bandura (1986) submitted that self-efficacy can be influenced through positive emotional support, encouragement and positive persuasion, models of success with which people identify, and experience mastering a specific task (Conger, 1989; Gist, 1987).

The concept of self-efficacy in sales functions has been studied by many behavioral scientists. Self-efficacy can have both direct and indirect effects on sales force performance (Krishnan, Netemyer, & Boles, 2002; Lee & Gillen, 1989) and on the ability of the sales force to adopt new concepts of tools (Avlonitis & Panagopoulos, 2005; Schillewaert, Ahearne, Frambach, & Moenaert, 2005). From a managerial perspective, sales managers can influence their individual sales representatives' behaviors, including job satisfaction and self-efficacy, by developing different leadership skills (Shoemaker, 1999). Other leadership dimensions are critical to developing the sales force's ability to learn and develop greater self-efficacy. They include job autonomy, customer demandingness, and trait competitiveness (Wang & Netemyer, 2002) as well as empowerment of the sales force (Ahearne, Mathieu, & Rapp, 2005).

2.5.2. Collective efficacy

During the past decade, studies on self-efficacy have evolved to include the perspective of teams and organizations to support the hypothesis that self-efficacy alone is not enough to reach greater collective outcomes (Bohn, 2001). The growing interdependency of individuals in organizations (Gully, Incalcaterra, Joshi, & Beaubien, 2002) requires greater collective agency and action among them through shared beliefs with the intention of accomplishing greater organizational outcomes. Social cognitive theory widens the concept of human agency to collective agency (Bandura, 2000). People share beliefs in their "collective power" to produce desired results. Socially shared cognitions are placed into an organizational context where people work together to accomplish desired outcomes and ends (Bohn, 2001). Among the social cognitions that a firm's members have are beliefs about or perceptions of their organization's capabilities. Bandura (1997:476) posits that "an organization's beliefs about its efficacy to produce results is undoubtedly an important feature of its operative culture."

Self-efficacy is central to the motivational concept of human action in organizations. Self-efficacy may be defined as a generative capacity of one's resources and abilities to cope with a control situation (Bandura, 1997). Collective efficacy refers to the perception of groups, teams, and other social collections who perceive the capability of a group at the group level (Bohn, 2001). A meta-analysis conducted by Gully et al. (2002) showed that the relationship between collective efficacy and team performance is positive and significant, thus supporting social cognitive theory's claim that efficacy is "a primary determinant of the extent to which individuals or teams are likely to put the efforts required to perform successfully" (Bandura, 1986:392). This notion of effort is also supported by other authors. Confidence consists of "positive expectations" for favorable outcomes and tremendous potential results (Hoover & Valenti, 2005:244). It influences the individual member's willingness to invest money, reputation, and emotional energy to shape the ability to perform (Kanter, 2006:7).

In this paper, we use the term collective efficacy and collective confidence interchangeably and adopt Bohn's definition and properties of organizational efficacy as an organizational factor affecting the adoption of pricing approach:

> Organizational efficacy is a generative capacity within an organization to cope effectively with the demands, challenges, stressors and opportunities it encounters within the business environment. It exists as an aggregated judgment of an organization's individual members about their (1) sense of collective capacities, (2) sense of mission or purpose, and (3) a sense of resilience. In its most basic form, organizational efficacy is a sense of "can do." (Bohn, 2001:39).

2.5.3. Collective efficacy and pricing

The adoption of modern pricing practices in firms coupled with the implementation of commercial programs focused on value strategies requires that managers design and implement people development programs to improve sales collective confidence. Such programs might include communication initiatives to foster shared beliefs about firm products and technology, coaching of commercial personnel to price and capture value with confidence (Anderson et al., 2007), and training of staff to generate greater courage to stand firm in the face of customers' pricing objections and be "superman for one second" when facing customers' objections (Hinterhuber & Liozu, 2012).

CEOs and top executives need to appreciate the criticality of developing these internal beliefs and implement specific programs and activities to boost collective confidence (Liozu et al., 2011). These shared beliefs in sales employees' "collective power" promote people working together, leading to the desired superior outcome (Bohn, 2001). Thus we conjecture the following:

H9. Sales collective confidence has a positive effect on relative firm performance when controlling for firm size, firm nature, firm geographical zone, respondent's years of experience, leadership position, market turbulences, and price realization.

3. Methods

3.1. Definition of the population

In 2011, we approached the Strategic Account Management Association (SAMA) about the possibility of surveying their membership on the topic of pricing confidence and firm performance. SAMA is a nonprofit organization devoted to developing and promoting the concept of customer–supplier collaboration and the concept of commercial excellence among the account management function. The 8000 active members of the SAMA offered a wide representation of the business-to-business world, because of their focus on commercial excellence, their representation of both the manufacturing and the service sectors, and their global nature.

SAMA membership consists of medium to large organizations including Fortune 500 corporate organizations (over 60%). SAMA also consists of a number of member segments including heads of

strategic account management program organizations and other senior management/C-level executives who sponsor or lead strategic accounts (40%); strategic/national/global account managers (35%); support managers, HR/training & development and other functional specialists (i.e. marketing, industry, financial, IT, etc.) (16%); and strategic account and sales consultants, academics, and researchers (9%). We focused on the 5250 active account management professionals and leaders who are involved in the commercial process as well as potentially engaged in the pricing activities.

3.2. Description of respondent sample

We followed the total design method, a method developed to secure high response rates from general and special samples and considered the standard for surveys in the social sciences (Dillman & Groves, 2009), as well as focused on improving the reliability and validity of survey responses. The total design method is a systematic approach to crafting survey questions, designing survey implementation procedures, and optimizing delivery methods to a specific pool of potential respondents. We sent a cross-sectional self-administered electronic survey in June 2011 to 5,250 relevant members of SAMA. Responses were returned over a 6-week period. About 200 "bounced back" and were assumed not to have reached the intended recipients. Of the remaining 5000 surveys, 723 were returned partially or fully completed, indicating a response rate of 13.8%. We determined 507 to be usable for further analysis, for an overall effective response rate of 9.7%. This is consistent with response rates for large-scale surveys, which have response rates between 5% and 10% (Roth & Van Der Velda, 1991; Shah & Ward, 2003; Stock, Greis, & Kasarda, 2000), and for surveys targeted at large professional organizations whose members are not typically asked to participate in academic research. However, our overall effective response rate is below response rates commonly accepted in top scholarly journals (Harzing, 1997; Workman et al., 2003). Our further investigation of our effective sample size indicates that the length of the survey (15 to 20 min) influenced respondents' desire to complete the survey, as suggested by a drop-off rate of over 30% once the survey was started. The nature of the survey might also have somewhat influenced the response rate. SAMA management indicated that this was the first survey dedicated to pricing and that, generally speaking, pricing has never been formally studied with the SAMA community. Nonetheless, our response rate is noted as one of our limitations later in this paper.

Table 1
Sample characteristics ($n = 507$).

Main activity	*Count*	*%*
Manufacturing firm	306	60%
Service organization	166	33%
Distribution/retail company	30	6%
Not sure	5	1%
Firm size—employee number	*Count*	*%*
Less than 250	77	15%
251 to 500	42	8%
501 to 1000	48	9%
1001 to 10,000	138	27%
More than 10,000	197	39%
Not sure	5	1%
Position of leadership (Y/N)	*Count*	*%*
Yes	346	68%
No	153	30%
Missing	8	2%
Geography of respondent's location	*Count*	*%*
North America	314	62%
Latin America	13	3%
Europe	115	23%
Asia Pacific	41	8%
Middle East/Africa	16	3%
Not sure	8	2%
Total respondents	507	

Our sample contains respondents from all continents, with those from North America representing the largest share (62%); in terms of firm size, respondents from firms with over 1000 employees account for the largest share of respondents (66%). Characteristics of the respondents are provided in Table 1.

Follow-up discussions with executives from SAMA indicated that the sample of respondents who took this survey were fairly consistent with the overall SAMA sample population when compared for main activity, leadership position, size, and, more specifically, considering the name of the firms selected to participate in the overall survey process. Our analysis of respondents' characteristics suggested a great level of diversity in our respondents, with no single firm having more than 10 responses. The diversity of firms that participated in the survey process indicates that we have an acceptable level of representation from the overall SAMA population. This information was qualitatively validated by SAMA membership management.

3.3. Measure development and assessment

We adapted most scales from the current literature with slight modifications to reflect our focus and developed a new scale to measure knowledge before negotiation and price realization. We developed new scales for pricing capabilities, for pricing realization, for incentive and goal systems, and for market turbulence. We then refined them through pretests and pilot testing using established item-development procedures and guidelines (Churchill, 1979).

Content validity was determined through a comprehensive review of the literature, pilot tests, and assessment by a group of pricing executives and scholars to make sure that measurement items were relevant to the theoretical scope related to the constructs (Churchill, 1979; Nunnally, 1978a). Next, a pilot test involving 150 professionals representing sales, commercial, business, and general manager functions from companies in both manufacturing and service industries provided 94 complete and usable responses. The survey was modified through a series of iteration to include all appropriate pilots and test results. The survey items are presented in the appendix.

3.3.1. Pricing capabilities

We developed a multiple-item scale in accordance with an operational definition as suggested by Kerlinger and Lee (1999: chap. 3) and by relying on our qualitative work and on extant research. We used 12 items ranging from 1 (*much worse than competitors*) to 7 (*much better than competitors*) to operationalize this scale.

3.3.2. Price realization

Since there was little empirical precedent to measure the degree of pricing realization or discipline in an organization, we also developed a multiple-item scale in accordance with an operational definition as suggested by Kerlinger and Lee (1999: chap. 3) and by relying on our fieldwork and on extant research. We used nine items ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) to operationalize this scale. These items were then transformed into a high-versus-low categorical variable using the median split of the summated items.

3.3.3. Pricing orientation

To gauge a firm's pricing orientation, we adapted the scales developed by Ingenbleek, Debruyne, Frambach, and Verhallen (2003) to measure value-based pricing (VBP; 5 items), competition-based pricing (COB; 6 items), and cost-based pricing (CB; 5 items). Items were measured using a 7-point Likert scale anchored at the extremes by 1 (*not at all taken into account in price setting*) and 7 (*very much taken into account in price setting*).

3.3.4. Delegation of pricing authority

The five-item scale was adapted from existing measures from Frenzen et al. (2010). We used these items, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), to operationalize this scale.

3.3.5. Pricing-process formalization

Pricing-process formalization was measured by the formalization component of structure (Pugh, Hickson, Hinings, & Turner, 1968). Measures were created based on a similar method proposed in the Aston studies (Inkson, Pugh, & Hickson, 1970; Pugh et al., 1968). The scale was formed by a sum of the number of 'ticks' in a given list of eight bi-serial items characterizing the degree of formalization such that the higher the measure, the greater the firm's formalization.

3.3.6. Sales collective confidence

Sense of collective capability (4 items), sense of mission and future (4 items), and sense of resilience (4 items) were assessed using 7-point, Likert-type scales anchored with 'strongly agree' at the extreme positive end and 'strongly disagree' at the extreme negative end. The 12-item scale was adapted from existing measures from Bohn (2001).

3.3.7. Incentives and goal systems

We adapted the eight-item scale developed and validated by Behrman and Perreault (1982) that focused on targets used by firms to define salesperson performance compensation. The 7-point, Likert-type scale was anchored with 'strongly agree' at the extreme positive end and 'strongly disagree' at the extreme negative end.

3.3.8. Knowledge before negotiation

Since there was little empirical precedent to measure the degree of pricing preparation prior to negotiation, we also developed a multiple-item scale in accordance with an operational definition as suggested by Kerlinger and Lee (1999: chap. 3) and by relying on our fieldwork and on extant research. We used four items ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) to operationalize this scale.

3.3.9. Market turbulences

We adapted and combined an eight-item scale developed and validated by Jaworski and Kohli (1993) and Santos-Vijande and Álvarez-González (2007). The 7-point, Likert-type scale was anchored with 'strongly agree' at the extreme positive end of the scale and 'strongly disagree' at the extreme negative end. These items were then transformed into a high, medium, and low categorical variable.

3.3.10. Firm performance

First, in line with previous research, we used a subjective assessment of firm performance (Ingenbleek, 2007; Morgan, Vorhies, & Mason, 2009; Simsek, 2007), following the convention of asking managers to compare their *firm's relative performance* with the performance of competitors on eight different dimensions for the past year (e.g., growth in sales, return on investment, return on sales) using a scale ranging from 1 (*much worse*) to 7 (*much better*) than competitors. Second, since firms in our sample were from a variety of geographical zones, a multidimensional measure based on perceptual firm performance facilitated comparisons across firms and contexts, such as across industries, time horizons, and economic conditions (Song, Droge, Hanvanich, & Calantone, 2005). Third, earlier studies showed that perceptual performance measures tend to be highly correlated with objective indicators, which supports their validity (Dess & Robinson, 1984). More recently, Kumar, Jones, Venkatesan, and Leone (2011) reported a high correlation (0.80) between subjective and objective data on firm performance.

3.3.11. Firm control variables

We controlled for a number of likely determinants of performance by including demographic characteristics of the firm, such as main activity (manufacturing, service, retail), size measured as the number of employees (Amburgey & Rao, 1996), and geographical zone. Respondent's years of experience and leadership position were also included as controls in our model. Finally, we added controls related to price realization (low/medium/high) and market turbulences (low/medium/high) to complete our investigation.

3.4. Non-response bias

A commonly used method for estimating the bias in strategy research (Armstrong & Overton, 1977) is to compare early and late responses among the variables. The test assumed that late respondents were more similar to non-respondents than to their early counterparts. One-way analysis of variance (ANOVA) tests, performed at the item level, indicated no significant differences in data derived from early versus late responders, except on 4 of the 90 (4.4%) variables. Consequently, it appears that bias present from the time of response is due to chance and thus provided some assurance against non-response bias.

3.5. Common method bias

Surveys from a single set of respondents can introduce common method bias (CMB) into the data. Consequently, we took several steps to mitigate, detect, and control for CMB. We carefully constructed all survey items, and, wherever possible, used pretested, valid, multidimensional constructs (Huber & Power, 1985). We varied the scale anchors and format in the questionnaire, performed a series of scale-validation processes before distribution, and invited business professionals to rate the measures.

Several *post hoc* tests determined the extent to which CMB was present in our data. Using Harman's single-factor test, we entered all 39 items into an unrotated principal components factor analysis to determine the number of factors necessary to account for the variance in the variables. If a single factor emerged or a single general factor explained more than 50% of the variance between the independent and dependent variables, common method variance might be present (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Our results indicated the presence of six potential factors (all with eigenvalues greater than 1) that explained a total of 53% of the variance. The first factor explained 31% of the variance. These results provide initial evidence that response bias does not appear to exist in the data (Podsakoff & Organ, 1986).

Next, we conducted a confirmatory factor analysis (CFA) based Harman's single-factor test in which we hypothesized a single common methods factor as causing all the indicators. The common methods factor extracted 32.9% of the variance. Additionally, an unrelated construct, a *marker* variable, revealed after the fact to have no relevant and significant correlation with other variables in the constructs, was added to the measurement model (Lindell & Whitney, 2001). Since we did not compute an unrelated construct a priori, we used a modified test with a weakly related construct scale composed of four unrelated items rejected during the exploratory factor analysis (EFA) process (Pavlou & Gefen, 2005). The marker variable extracted 9% of the variance.

We also examined multicollinearity and CMB with linear regression analysis on the study constructs and found low variance-inflation factors. Multicollinearity can be ruled out because no two predictor variables correlated more strongly than .70 (Hair, Black, & Anderson, 2010). Finally, we examined the correlation matrix and found no highly correlated factors (highest correlation is $r = .606$), whereas the presence of CMB should have resulted in extremely high correlations ($r > .90$). Based on these test results, shown in Table 2, multicollinearity is not present, and CMB does not appear to pose a problem with our analysis.

3.6. Measurement models

We conducted an EFA on the sample dataset using principal axis factoring with Promax rotation. For all but eight items, communalities

Table 2
Correlations of constructs.

Constructs	Pricing capabilities	Sales collective confidence	Relative performance	Delegation of pricing authority	Knowledge before negotiation	Incentive & goal systems
Pricing capabilities	**0.55**					
Sales collective confidence	0.606	**0.53**				
Relative performance	0.470	0.505	**0.62**			
Delegation of pricing authority	0.082	0.100	0.000	**0.56**		
Knowledge before negotiation	0.541	0.578	0.309	0.072	**0.57**	
Incentive & goal systems	0.425	0.412	0.173	0.140	0.388	**0.49**

Bolded values on the diagonal are the AVE's.

exceeded the minimal acceptable threshold of .50 (Hair et al., 2010). Additionally, both the Kaiser–Meyer–Olkin (KMO) value of .925 and Bartlett's Test of Sphericity ($\chi^2_{741df} = 11350.7$; $p = .000$), exceeded the acceptable threshold levels, indicating the appropriateness of the data for factor analysis. The EFA yielded six factors, consistent with our conceptual model as displayed in Table 3. Each item significantly loaded on its respective factor with a value greater than .40 and no cross-loadings of more than .20 (Hair et al., 2010; Igbaria, Iivari, & Maragahh, 1995). The total variance explained by these six factors was 53%.

The final number of items represented by the six factors, after completion of the EFA, was 39. Additionally, the reliability of each of the final six factors was computed as shown in Table 3 and in most cases exceeds the minimum acceptable threshold of 0.70 (Nunnally, 1978b). Table 2 provides the correlations between the factors. All of the average variance extracted (AVE) values exceed the square of the correlation between the constructs, thus demonstrating discriminant validity.

We assessed the psychometric properties of the six factors derived from the EFA using a CFA to validate the factor structure. The measurement model was constructed incorporating each construct and the associated items. The model was further trimmed, and appropriate covariance relationships were added when theoretically justified (Byrne, 2009). The overall fit for the model is good: CMIN/DF = 1.780, CFI = .965, RMSEA = .039 (90% confidence interval 0.034–0.044), PCLOSE = 1.00. The composite reliability (CR) for each construct is provided in Table 4. The CR values exceed the acceptable threshold level (>0.70), and the AVE values confirm the reliability of the indicators and demonstrate convergent validity. For discriminate validity we show that for all constructs the maximum shared variance (MSV) and average shared variance (ASV) are less than the AVE (Fornell & Larcker, 1981).

We tested for metric and configural invariance to identify whether the factor structure is equivalent across different groups. The good model fit demonstrated configural invariance across the three types of pricing orientation and across regions. Further analysis of metric invariance suggested that groups were also invariant. We concluded that these groups are equivalent and adequate for further analysis.

4. Results

We tested our hypotheses using structural equation modeling (SEM). SEM was particularly relevant for this analysis as multiple associations can be uncovered, integrating observed and latent constructs in these associations, and because biasing effects of random measurement error in the latent constructs (Medsker, Williams, & Holahan, 1994) can be accounted for.

The results are shown in Table 6. All hypothesized relationships are significant, except for H3, H8, H9. The fit indices for the final structural model (Table 5) shown in Fig. 2 indicate that this model reaches an acceptable goodness of fit:

First, pricing capabilities have a positive and significant impact on relative firm performance ($b = 0.381$, $p < .01$) and on sales collective confidence ($b = 0.304$, $p < .01$). Our findings support H1 and H2.

Second, the impact of delegation of pricing authority ($b = 0.053$, $p < 0.1$), incentive and goal systems ($b = 0.173$, $p < .01$), and knowledge before price negotiation ($b = 0.345$, $p < .01$) on sales collective confidence are all significant. However, pricing-process formalization does not have a positive and significant influence on sales collective confidence ($b = 0.012$, $p = 0.356$). These results provide support for H3, H6, and H8 but not H4, respectively. Third, sales collective confidence has a positive and significant influence on relative firm performance ($b = 0.415$, $p < .01$), validating H9. Finally, incentive and goal systems are found to be negatively and significantly related to relative firm performance ($b = -0.169$, $p < 0.01$). Since we hypothesize a positive relationship between these two variables, H7 is not supported. Overall, all but two of our eight direct-effect hypothesized relationships are supported.

Our analysis of moderation reveals that primary pricing orientation does not moderate the relationship between pricing capabilities and relative firm performance. This relationship remained positive and significant when firms adopted value, cost, or competition as their primary pricing orientation. H5a is not supported. Similarly, the relationship between sales collective confidence and relative firm performance remains positive and significant for all three pricing orientations. Thus H5b is also not supported. However, we find significant moderation for primary pricing orientation in the relationship between incentive and goal system and relative firm performance. For pricing orientation based on competition ($b = -0.248$, $p < 0.01$) and cost ($b = -0.181$, $p < 0.05$), incentive and goal systems are negatively and significantly related to relative firm performance. These results are not found for pricing orientation based on customer value ($b = -0.141$, $p = 0.073$). H5c is supported.

We control for nature of the firm, geographical region, years of experience of the respondents, size of the organization, and whether the respondent has a leadership position or not, as well as for price realization

Table 3
EFA measurement model.

Construct	No. of items	Loadings	Cronbach's alpha
Pricing capabilities	11	0.739;0.625;0.613;0.608;0.664;0.790;0.715;0.852;0.557;0.830;0.767	0.923
Sales collective confidence	9	0.660;0.803;0.618;0.776;0.756;0.845;0.607;0.641;0.625	0.904
Relative performance	7	0.589;0.620;0.566;0.619;0.756;0.970;0.817	0.875
Delegation of pricing authority	4	0.745;0.618;0.743;0.863	0.826
Knowledge before negotiation	4	0.759;0.672;0.683;0.695	0.839
Incentive & goal systems	4	0.556;0.612;0.600;0.556	0.739

Table 4
Construct reliability and validity results.

Constructs	Cronbach's alpha	CR	AVE	MSV	ASV
Pricing capabilities	0.923	0.91	0.55	0.37	0.24
Firm performance	0.875	0.86	0.62	0.27	0.14
Sales collective confidence	0.904	0.90	0.53	0.38	0.26
Delegation of pricing authority	0.826	0.83	0.56	0.02	0.01
Knowledge before negotiation	0.839	0.84	0.57	0.38	0.21
Incentive & goal systems	0.739	0.73	0.49	0.25	0.16

and market turbulence levels. Table 7 shows the relationship of the control variables to the dependent variables.

We find that pricing realization category (high versus low) has a significant influence on sales collective confidence ($b = 0.096$, $p < 0.1$) but not on relative firm performance ($b = -0.017$, $p = 0.784$). Similarly, market turbulence category (low, medium, and high) has a negative and significant influence on relative firm performance ($b = -0.104$, $p < 0.01$) but not on sales collective confidence ($b = -0.034$. $p = 0.246$).

5. Discussion

The findings of our research study offer several potential theoretical and managerial implications.

5.1. Theoretical implications

Confidence is a "can do" attitude that can make or break change programs in organizations (Bohn, 2001). Confidence in pricing is an essential organizational characteristic that allows teams to take on tough challenges, transform their sales and pricing practices (Liozu et al., 2011), and show resilience in the face of potential customer rejection (Hinterhuber & Liozu, 2012). This study improves our understanding of what drives sales collective confidence for pricing and whether firms might design specific organizational elements to affect their pricing confidence and achieve superior relative performance. Our results support the proposition that a unique organizational design for the pricing function (emphasizing capabilities, confidence, and knowledge) leads to greater relative firm performance. Our ability to statistically link these organizational characteristics to firm performance is an important contribution to knowledge about pricing. Our findings are unique in that prior research had not linked the construct of sales collective confidence to pricing and subsequently to firm performance. Our findings also elaborate on the findings of previous studies related to pricing (Ingenbleek, 2007) and offer four substantive contributions.

First, our results demonstrate the need for firms to raise the profile of their pricing function and to intentionally adopt pricing strategies that may increase internal organizational efficacy. The role of executives in the corporate suite is essential to the design and sustainable implementation of a pricing orientation (Liozu & Hinterhuber, 2013c). Top executives will need to pay more attention to pricing, develop a pricing vision, and create a distinctive organizational architecture for pricing. By investing in the development of pricing capabilities that generate a sustainable and inimitable competitive advantage (Dierickx & Cool, 1989; Dutta et al., 2003), champions of pricing forge a shared vision, a collective "can do" mentality, and a sense of collective resilience in the sales team that lead to superior levels of organizational efficacy (Bohn, 2001) and superior outcomes.

Second, our results support a resource-based theory of the firm in that pricing capabilities positively and significantly influence firm performance vis-à-vis competition. Marketing capabilities have been the subject of dozens of academic research studies. Many of them show a positive link between pricing capabilities – a sub-dimension of marketing capabilities – and firm performance (Morgan et al., 2009; Vorhies & Morgan, 2005). However, these studies measured pricing capabilities as part of a much wider set of marketing capabilities. In other studies, pricing capabilities were investigated using case study or qualitative — but not quantitative-research methods. Our inquiry is unique in providing a robust pricing capability construct that can be used in future studies, as well as a causal model linking pricing capabilities to relative firm performance.

Last, and in aggregate, our findings show that the five organizational and behavioral elements we identified as being related to pricing (four antecedents and sales collective confidence) can create a competitive capability which in turn leads to better firm performance. Our findings suggest that the importance of organizational behaviors in the marketing and pricing literature has been underestimated and that multi-disciplinary research may be needed to further investigate the relationships.

Table 5
Fit statistics.

Model fit measures	Threshold	Structural model	References
Chi-square/Df		5.906/5	
p-Value	<0.05	0.315	Non-significant
CMIN/DF	<2	1.181	Tabachnick and Fidell (2007)
PCFI	>0.5	0.139	Hu and Bentler (1999)
CFI	>0.95	0.999	Hu and Bentler (1999)
RMSEA	<0.06	0.019	Hu and Bentler (1999)
Pclose	>0.5	0.82	Jöreskog and Sörbon (1993)

5.2. Managerial implications

Our findings suggest that leaders in firms who design purposeful strategies and programs to boost collective confidence in their sales and account management teams can achieve significantly greater firm performance. The unique combination of the organizational elements related to pricing explored in our research (capabilities, delegation of pricing authority, incentive and goal systems, and knowledge before negotiation) might be able to create a higher level of comfort and confidence in the pricing function and pricing activities for those in account management roles. Previous research on pricing has suggested that it is a very complex function (Dolan & Simon, 1996) that is subject to internal conflicts and tensions (Lancioni et al., 2005). Establishing a confident climate for sales and account management to address this complexity might lead to greater performance outcomes. Therefore, we conjecture that the development and the deployment of unique intellectual capital in pricing (Dutta et al., 2002), also characterized as "brain ware" (Liebowitz, 2000:1), throughout the organization, creates superior pricing intelligence that leads to superior firm performance.

Our study reveals that increasing the level of pricing-process formalization does not necessary increase the confidence of sales and account management professionals who deal with pricing. We expected that there would be a positive relationship between these two constructs, and that process formalization would lead to a greater degree of adoption by sales and account professionals. There is a belief in many organizations that process orientation leads to greater compliance and superior performance. This hypothesized relationship was not supported by our findings and might need further investigation.

Last, our research findings suggest that commercial leaders and top executives should focus more on the notion of collective confidence when designing organizational development and people management programs. Traditional programs are focused on the development of the individual efficacy and self-esteem levels of individual sales professionals. Another approach might integrate programs and activities to boost collective confidence of account management teams. These programs might include specific incentive and reward programs, unique training and coaching sessions, compelling communication tactics to celebrate wins and promote success stories, and charismatic leadership from the C-suite, as suggested by our qualitative findings.

Table 6
Results of hypothesis testing.

Hyp	Hypothesized paths	Regression estimates	Standardized estimate	Critical ratio	Hypothesis supported
H1	Pricing capabilities to sales collective confidence	0.237	0.304***	0.033	Yes
H2	Pricing capabilities to relative firm performance	0.318	0.381***	7.990	Yes
H3	Delegation of pricing authority to sales collective confidence	0.029	0.053*	1.805	Yes
H4	Pricing process formalization to sales collective confidence	0.005	0.012 (ns)	0.356	No
H6	Incentive & goal systems to sales collective confidence	0.136	0.173***	4.665	Yes
H7	Incentive & goal systems to relative firm performance (+)	−0.143	−.169***	−3.840	No
H8	Knowledge before price negotiation to sales collective confidence	0.335	0.345***	7.255	Yes
H9	Sales collective confidence to relative firm performance	0.446	.415***	8.607	Yes
H5a	Primary pricing orientation moderates pricing capabilities to firm performance		Value = 0.265*** Cost = 0.400*** Competition = 0.458***		No
H5b	Primary pricing orientation moderates sales collective confidence to firm performance		Value = 0.373*** Cost = 0.403*** Competition = 0.472***		No
H5c	Primary pricing orientation moderates incentive & goal systems to firm performance		Value = −.142 (ns) Cost = − 0.181** Competition = −0.248***		Yes
	R square relative firm performance	0.417			
	R square organizational confidence	0.583			

*** p < 0.01.
** p < 0.05.
* p < 0.1.

6. Limitations and future research

We explore a topic that has previously received little attention in either practitioner or scholarly literature. Five potential limitations of our work should be acknowledged.

The first is causality. Our quantitative survey uncovers some interesting and significant relationships between potential antecedents of sales collective confidence in pricing, sales collective confidence in pricing itself, and relative firm performance. We base our hypothesized model on previous inquiry in the field of pricing and on practitioners' work in the area of sales force management. Nevertheless, this survey is cross-sectional, and we cannot rule out reverse causality due to lack of longitudinal performance data to show performance improvements.

Second, the performance measures we used are perceptual and not objective in nature. However, perceptual or subjective data used on quantitative surveys to gauge firm performance has recently been advocated and accepted in the strategic management literature (Dess & Robinson, 1984).

Third, our respondents included a large number of SAMA member firms but may not necessarily be representative of all firms conducting account and sales management activities with respect to their management of their pricing process. It is also possible that SAMA members do not represent the "typical" B2B sales profile because of their level of experience and the size of the organization's membership.

Fourth, because our survey was self-administered, results may not reflect what respondents actually do when managing the pricing process. Babbie (2007:276) said, "Surveys cannot measure social action: they can only collect self-reports of recalled past action or of prospective or hypothetical action." In other words, there might be organizational and behavioral dynamics that affect the pricing process and how pricing decisions are made in firms. In order to understand these factors, it might be useful to complement these results with observations in the field and additional qualitative research.

Finally, no statistical test can assure a bias-free analysis (Podsakoff et al., 2003). We made a purposeful effort to minimize CMB. Still, it would have been preferable to include multiple respondents from

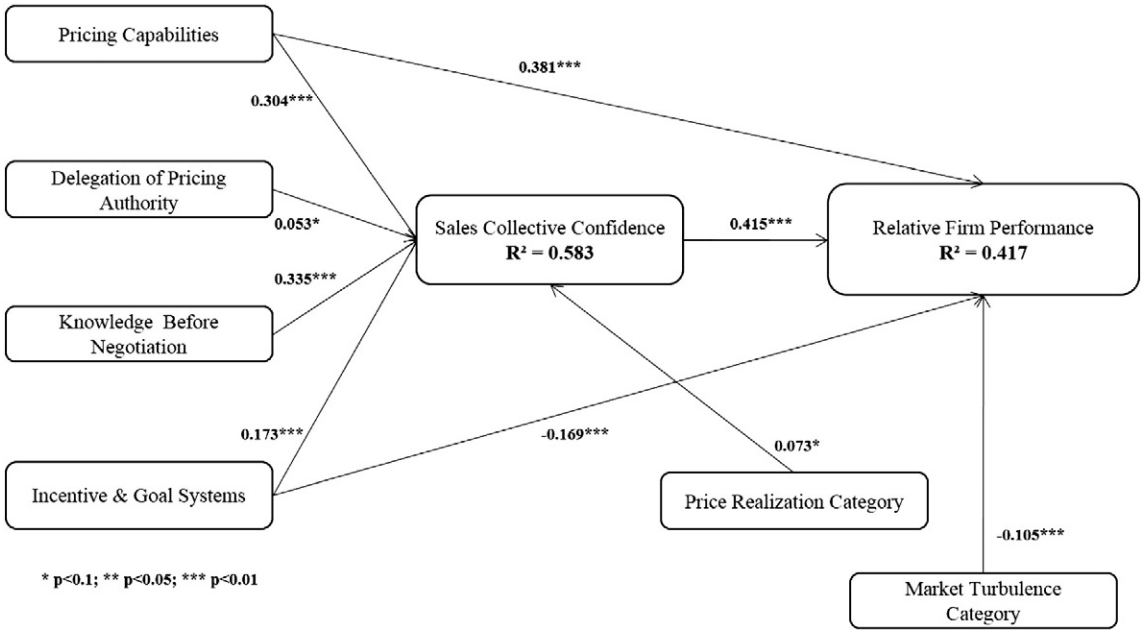

Fig. 2. Structural model.

Table 7
Controls.

Controls	Dependent variables	Standardized estimates	P value
Nature	Relative firm performance	−0.190	0.574
Nature	Sales collective confidence	0.033	0.265
Geozone	Relative firm performance	−0.041	0.241
Geozone	Sales collective confidence	−0.039	0.18
Years of experience	Relative firm performance	0.020	0.563
Years of experience	Sales collective confidence	0.025	0.39
Size	Relative firm performance	−0.002	0.954
Size	Sales collective confidence	−0.031	0.295
Leadership (Y/N)	Relative firm performance	−0.033	0.353
Leadership (Y/N)	Sales collective confidence	−0.230	0.432
Pricing realization category	Relative firm performance	−0.017	0.784
Pricing realization category	Sales collective confidence	0.096	0.075*
Market turbulence category	Relative firm performance	−0.104	0.002***
Market turbulence category	Sales collective confidence	−0.034	0.246**

*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.1$.

each participating company and to use different objective measures for the dependent variables. Recognizing the difficulties of this, we used an "informed observer" approach to best reflect firm behavior.

Recognizing these limitations, we invite behavioral and social researchers as well as pricing scholars to continue the research work in the area of collective confidence among sales and account management teams, and to extend the research agenda to the organization itself. There has been much research on charismatic and transformational leadership and how these influence firm performance. Linking these concepts to organizational confidence can shed light on how teams and organizations develop a greater sense of collective power and energy to lead their organizations through difficult technology deployments, cultural changes, and challenging growth programs.

Appendix A. Survey items labels

Items	*Pricing capabilities*
PC1	Using pricing skills and systems to respond quickly to market changes
PC2	Knowledge of competitors' pricing tactics
PC3	Doing an effective job of pricing products/services
PC4	Monitoring competitors prices and price changes
PC5	Sticking to price list and minimizing discounts
PC6	Quantifying customers' willingness to pay
PC7	Measuring and quantifying differential economic value versus competition
PC8	Measuring and estimating price elasticity for products/services
PC9	Designing proprietary tools to support pricing decisions
PC10	Conducting value-in-use analysis or Total Cost of Ownership
PC11	Designing and conducting specific pricing training programs
PC12	Developing proprietary internal price management process
Items	*Relative performance*
RP1	Acquisition of new customers
RP2	Increase of sales to current customers
RP3	Growth in total sales revenues
RP4	Absolute price levels
RP5	Pricing power in the market
RP6	Business Unit profitability
RP7	Return on sales (ROS)
RP8	Return on investment (ROI)
Items	*Knowledge before negotiation*
PR10	Before we negotiate, we know the competitive product/service that the customer views as better than ours
PR11	Before we negotiate, we know the price level of the customer's current product/service
PR12	Before we negotiate, we know the differentiated value of our vs. the customer's current product/service
PR13	Before we negotiate, we know the financial benefit ("dollar value") of our vs. the customer's current product/service
Items	*Incentive & goal systems*
IGS1	Increase market share by acquiring new customers
IGS2	Increase gross dollar sales
IGS3	Sell customer on products with the highest profit margins
IGS4	Identify and sell to major accounts
IGS5	Exceed sales targets and objectives during the year
IGS6	Support voice-of-the-customer activities
IGS7	Identify customer value information
IGS8	Increase sales volume
Items	*Sales collective confidence*
OC1	We can take on any challenge
OC2	Because our departments work together well, we can beat our competition
OC3	We are more innovative than most organizations I have worked in
OC4	Everyone works together effectively
OC5	People here have a sense of purpose to accomplish something
OC6	We have a strong vision of the future
OC7	We are very certain about what we will accomplish together as a company
OC8	We are confident about our future
OC9	We believe in the value of our products/services
OC10	We have the necessary courage to stand firm to customers' pricing objections
OC11	We have the necessary courage to implement difficult price changes in the market
OC12	We have a strong sense of resilience with pricing
Items	*Delegation of pricing authority*
DPA1	Our sales people have the authority to set prices and discounts for all customers
DPA2	Our sales people have the authority to set prices for some customers
DPA3	Our sales people have more authority than our competitors to set prices and discounts
DPA4	Our sales people are authorized to reduce prices only after consulting with a superior
DPA5	All our sales people are provided with pricing authority

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The general theory of behavioral pricing: Applying complexity theory to explicate heterogeneity and achieve high-predictive validity☆

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ABSTRACT

Building behavioral-pricing models-in-contexts enriches one or more goals of science and practice: description, understanding, prediction, and influence/control. The general theory of behavioral strategy includes a set of tenets that describes alternative configurations of decision processes and objectives, contextual features, and beliefs/assessments associating with different outcomes involving specific price-points. This article explicates these tenets and discusses empirical studies which support the general theory. The empirical studies include the use of alternative data collection and analytical tools including true field experiments, think aloud methods, long interviews, ethnographic decision-tree-modeling, and building and testing algorithms (e.g., fuzzy-set qualitative comparative analysis). The general theory of behavioral pricing involves the blending of cognitive science, complexity theory, economics, marketing, psychology, and implemented practices. Consequently, behavioral pricing theory is distinct from context-free microeconomics, market-driven, and competitor-only price-setting. Capturing and reporting contextually-driven alternative routines to price setting by a compelling set of tenets represent what is particularly new and valuable about the general theory. The general theory serves as a useful foundation for advances in pricing theory and improving pricing practice.

1. Introduction

> Strategy theory has converged on a view that the crucial problem in strategic management is firm heterogeneity—why firms adopt different strategies and structures, why heterogeneity persists, and why competitors perform differently.
>
> [(Powell, Lovallo, & Fox, 2011, p. 1370)]

Powell et al. (2011, p. 1371) go on to define "behavioral strategy" as follows: "Behavioral strategy merges cognitive and social psychology with strategic management theory and practice. Behavioral strategy aims to bring realistic assumptions about human cognition, emotions, and social behavior to the strategic management of organizations and, thereby, to enrich strategy theory, empirical research, and real-world practice." "Merges" is the operative word for describing, understanding, predicting, and influencing behavioral strategy and its sub-fields including behavioral pricing.

The focus on capturing heterogeneity, realism, and the centrality of the merging tenet builds from the behavioral theory of the firm's perspective that organizations comprise differentiated subunits with conflicting goals, resources, and time horizons (Cyert & March, 1963). Marketing, pricing, and organizational buying strategies are largely political processes within specific contexts; these contexts involve coalition building, bargaining, and conflict resolution among representatives of differentiated subunits with conflicting goals, resources, and time horizons (Cyert & March, 1963; Pettigrew, 1975). However, while including strategy as a political process, behavioral pricing theory goes beyond this perspective to include cognitive science theory and findings especially on how executives transform information into knowledge and how they create and apply useful algorithms (i.e., rules on how-to-decide that usually lead to desirable outcomes) in selecting choices outcomes (e.g., acceptable specific price-points and increases/decreases in prices). Examples of such cognitive science advances in behavioral pricing in business-to-business contexts include the studies by Morgenroth (1964), Howard and Morgenroth (1968), Joskow (1973), Woodside and Wilson (2000), and Woodside (2003). These B2B studies and additional studies in business-to-consumer contexts (e.g., Woodside, Schpektor, & Xia, 2013) support the conclusion that the general theory of behavioral pricing is an insightful and useful blending of cognitive science, complexity theory, economics, marketing, psychology, and implemented practices in explicit contexts.

The core contributions of the present study and the general theory of behavioral pricing include explicating and solving the principal dilemma for advancing theory and research on behavioral pricing—that is, the need to generalize beyond the individual case and the need for

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specificity (reporting the nitty-gritty details necessary for deep understanding that captures the requisite complexity/heterogeneity within the individual case). Solving the dilemma includes embracing several steps possible but rarely taken-in-combination in pricing research; these steps include going into the field to perform "direct research" (Mintzberg, 1979) and embracing the major tenets of complexity theory (Byrne, 1998, 2005; Manson, 2001; Simon, 1962; Urry, 2005). The major tenets of complexity theory include the proposition that multiple paths lead to the same outcome/price, that is, "equifinality" occurs—alternative asymmetric combinations of indicators (i.e., algorithms) are sufficient but no one combination is necessary for predicting the occurrence of a specific pricing decision. A second tenet: causal asymmetry occurs, that is, indicator configural models that accurately predict a high price-point are not the mirror opposites of the indicator configural models that accurately predict a low price-point. A third tenet: both low and high price-points are antecedents to purchase in different sets of complex antecedent configurations. A corollary to the third tenet: both low and high price-points are antecedents to non-purchase in different sets of complex antecedent configurations. A fourth tenet: no one necessary antecedent condition is sufficient for purchase (e.g., low price alone is insufficient for purchase). A fifth tenet: theorists and practitioners never explicate all necessary conditions; thus, mistakes occur and learning is a continuing process forevermore.

Another complexity theory tenet is that, "Relationships between variables can be non-linear with abrupt switches occurring, so the same "cause" can, in specific circumstances, produce different effects." ("The Complexity Turn," Urry, 2005, p. 4). Thus, an increase in customer demand may be an outcome of a price increase "in specific circumstances [contexts]" and an increase in demand may be an outcome of a price decrease in other specific contexts. The same point is relevant for demand decreases and price increases and decreases. The general theory of behavioral pricing includes explicating the specific configural contexts for the occurrences of all four price-demand relationships: demand increases associating with price increases and decreases and demand decreases associating with price increases and decreases.

The complexity turn to behavioral pricing practice and theory includes the tipping-point tenet as Urry (2005) and Gladwell (2002) describe. "Moreover, if a system passes particular thresholds with minor changes in the controlling variables, switches occur such that a liquid turns into a gas, a large number of apathetic people suddenly tip into a forceful movement for change (Gladwell, 2002). Such tipping points give rise to unexpected structures and events whose properties can be different from the underlying elementary laws" (Urry, 2005, p. 5). In behavioral pricing models such tipping points frequently involve replacing a negative with a positive response to one issue in a string (i.e., path or recipe) of questions and answers for a given complex configuration of antecedent conditions. Examples of such "causal complexity" (Ragin, 2000) appear in empirical examples later in the present study.

Following this introduction, Section 2 presents the general theory of behavior pricing in the form of the theory's major tenets and by illustrating applications of these tenets in industrial marketing and B2B-service contexts. Section 3 describes complementary research methods useful for examining the tenets of the general theory and advancing new tenets. Section 4 discusses limitations in the study. Section 5 offers practical implications for planning and implementing pricing strategies in B2B contexts. Section 6 concludes with comparisons between the microeconomic and rational view of pricing decisions/outcomes and the general theory of behavioral pricing. Section 6 includes implications for further theory development and new research in behavioral pricing.

2. The general theory of behavior pricing

The three major objectives of the general theory include capturing heterogeneity of pricing decisions by marketers and responses to pricing decisions by customers; building isomorphic models of information-in-use within real-life contexts—of marketing and customer organizations participating in price-setting and price-responding (customer price-responses include evaluating, negotiating, and accepting/rejecting proposal and specific price-points of a vendor); and achieving high predictive validity (accuracy) that includes highly accurate predictions via heuristics-in-use by the vendors and the customers in deciding issues relating to setting and accepting/rejecting products/services for different price-points. Not all pricing researchers value these objectives highly; Joskow (1973) points out that some researchers criticize attempts to construct models of actual decision-making processes. Friedman (1966) argues that it is not a function of economic theory to recreate the real world, but to construct theoretical paradigms that predict well. Joskow (1973) responds to Friedman's perspective with evidence that current (i.e., symmetric-based) models of regulated firms do not predict pricing behavior very well. "In addition, the value of 'as if' models declines as we not only become interested in predicting how firms behave given current structural interrelationships, but begin to ask questions about structural changes aimed at changing the nature of firm responses. For those interested in public policy analysis regarding regulated [utility] industries, a more detailed [nuanced] understanding of firm decision processes, decision processes of regulatory agencies, and their interrelationship appears to be in order" (Joskow, 1973, pp. 119–120). This behavioral theory perspective is relevant for less regulated industries as well—a more detailed understanding is necessary (that is now lacking) of firm pricing-decision processes, customers' decision processes in evaluating and responding to marketers' responses to RFQs (request for quotation), and the subsequent process-dynamics—and final price points offered and accepted/rejected.

In his data collection during 1970–1971 on advancing a behavioral theory of pricing in highly regulated firms, Joskow (1972, 1973) did manage to take the necessary step of doing direct research but his data analysis is limited to symmetric testing via regression modeling. The idea of testing for sufficient but not necessary outcomes via algorithm modeling was advocated more than two decades later by McClelland (1998) and advanced substantially by Charles Ragin in several publications including his masterwork, *Ragin* (2008). Asymmetric theory and analysis of Joskow's (1972) behavioral pricing data await doing. However, unfortunately Joskow (2015) reports that his Ph.D. dissertation (Joskow, 1972) does not include the data and the data are no longer available.

2.1. The most in-depth behavioral pricing study

Unfortunately, the most in-depth, available, behavioral study of firms engaging (i.e., colluding illegally in this case) in setting prices in a business-to-business industry (Eichenwald, 2001) does not provide details with respect to conversations and decisions regarding specific price-points in the price-fixing meetings. Eichenwald (2001) does not report on customers' responses to the pricing decisions made by the colluding industrial (agricultural chemicals) marketers. The development of ethnographic pricing models using the price-collusion original data set awaits the researcher willing to wade into the court records and the FBI (U.S. Federal Bureau of Investigation) files—the multiple decision processes and outcomes in these processes that are available over a five-year period. Such research on decision processes of price setting and changes in B2B contexts rarely is available but the literature does include example studies (e.g., Howard & Morgenroth, 1968; Morgenroth, 1964; Woodside & Wilson, 2000).

2.2. Capturing heterogeneity

To capture heterogeneity, the general theory of behavioral pricing does not rely alone on the use of written surveys with fixed-point scales and symmetric statistical tests of observable choices by vendors and

customers but includes "direct research" (Mintzberg, 1979) ethnographic methods to record tacit knowledge and cognitive processes preceding the observable outcomes. These ethnographic methods include participant observation, applications of the think aloud method, historical analysis of documents, and the long interview method (Gladwin, 1980, 1982, 1983; McCracken, 1988; Woodside, 2010)—and the use of asymmetric analytics such as reporting on the use/value of fast and frugal heuristics (Gigerenzer, Todd, & the ABC Research Group, 1999) as well as fuzzy-set qualitative comparative analysis (Ragin, 2008). Direct research is going physically into the context of the study to observe, interview, record, and examine rather than rely principally on data from an internet, mail, or telephone survey. The later studies typically involve one executive responding per firm and less than 25 in 100 firms providing useable responses to the fixed-point scale items. Direct research seeks confirmatory evidence from multiple sources having direct knowledge of processes and the outcomes of thinking and actions of participants enacting behaviors related to a given context or issue.

While the core tenets of the general theory apply across B2B contexts and firms in different industries, presenting the tenets here make use of findings from a specific industrial marketing-buying pricing study (e.g., Woodside & Wilson, 2000). Taking a meso-step toward generalization, the study here describes how the tenets apply to a second study—a study on pricing petroleum at the wholesale level. The first study (Woodside & Wilson, 2000) included multiple-rounds of meetings of executives by the researchers at the marketing headquarters of a solvents manufacturer in Houston and long interviews, face-to-face, with four of the manufacturer's customers and 250 file-drawer customers; the four customers interviewed were located in Cleveland, north-central Pennsylvania, and western South Carolina. Each customer interview was ninety minutes; customers were selected that filled certain profiles of interest in the study—configurations of customers with large versus small purchasing requirements for solvents and both aggressive versus non-aggressive customers. Fig. 1 is an "ethnographic decision tree model (EDTM)" (Gladwin, 1989) of the marketer's framing and price-point selection processes for four customers in the study and more than 250 additional customers. EDTMs are suitable for linear programming and for use in testing the predictive accuracy of the algorithms appearing in subroutines in the model via fuzzy-set qualitative comparative analysis (Ragin, 2008; Woodside, 2010). EDTMs are isomorphic representations of reality in the thinking and doing processes of pricing and responding to specific price-points. While being a complex, heterogeneous model, the thoughts and actions of the product managers and sales representatives in this firm center on asking a brief series of questions. The questions cover the following issues. How much business does the customer represent (box 2)? How does the customer frame key aspects of his/her firm's relationship with us and our competitors (boxes 3–7)? Which objectives should dominate our response to the customer's response to our proposal (boxes 15 and 16)? For example, if the customer firm is a key account (i.e. large business for the marketer) and the customer insists on achieving a price reduction, the marketer is likely to respond with a "creative proposal" that includes: first, a low price; second, funding for storage equipment or related facilities at the customer's sites; and third, "price protection" against price increases during the contract period. Whether or not such an outcome occurs depends on the marketer's belief that "preferred supplier participation" status was given to the marketer's firm by the customer—a euphemism for being awarded the largest share or 100% of the customer requirements for solvents.

2.3. The core tenets in the general theory of behavioral pricing

The following discussion covers the core tenets (T_is) of the general theory of behavior pricing. While the discussion of each tenant refers

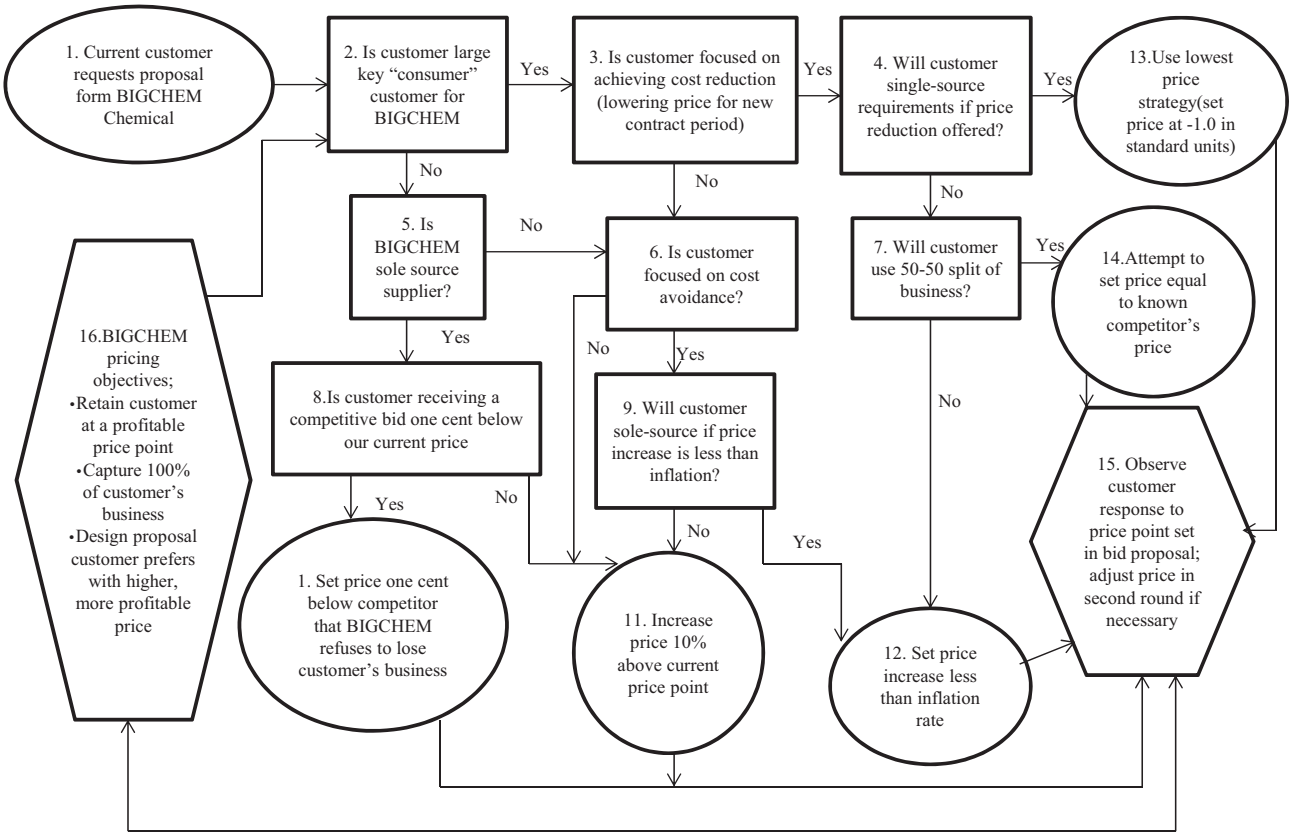

Fig. 1. Summary pricing, and sales negotiations, decision model for BIGCHEM chemical based on customer decision profiles. Source: Adapted from Fig. 6 in Woodside and Wilson (2000, p. 363).

to findings in the study by Woodside and Wilson (2000), these tenets are applicable and prevalent for nearly all pricing contexts in business and industrial marketing/purchasing contexts. "High score" in the following discussion refers to a calibrated score in fuzzy or crisp set qualitative comparative analysis (fsQCA, see Ragin, 2008). All QCA calibrated scores range from 0.00 to 1.00. Such calibrated scores indicate the degree of membership in a condition. For example, the score may indicate membership in "high price" with a score of 0.30 being a relatively low score in high price and a score of 0.95 equal to a score of "full membership" in high price. Calibrated scores do not indicate probabilities. From a practical as well as theoretical perspective, small-to-medium changes in fuzzy-set calibrated reference-points rarely change the substantive impact of findings in studies using QCA (for additional details, see Ragin, 2008; Woodside, 2013).

2.3.1. T_1: a case (e.g., one specific price decision among 100 + decisions) with a high score in one antecedent condition is insufficient in associating with a high or low outcome score (e.g., a high price-point)

A few specific combinations of two-plus antecedent conditions are sufficient in identifying with an outcome condition of particular interest (e.g., a high or low price-point) but a single antecedent condition is not. Consciously and/or unconsciously decision-makers (DMs) process two-plus antecedent conditions to reach a conclusion, decision, and action. For example, in Fig. 1 the shortest path to an outcome involves asking and answering three questions. In Fig. 1 "cost reduction" is a B2B purchasing term that refers to seeking price decreases in purchasing requirements from a supplier; "cost avoidance" refers to seeking price increases less than the industry price inflation rate. Cost reduction is a more aggressive stance some buyers assume than cost avoidance. A "market price" stance is less aggressive than cost avoidance; willing to accept "list price" is the least aggressive purchasing stance.

Related to Fig. 1, not all key account customers adopt a highly aggressive stance with respect to price. Consequently, a key account may or may not receive a low price quote or the lowest price quote. A specific price-point in a response to an RFQ depends on the combination of two-plus antecedent conditions. From the perspectives of data analysis and sense-making, a discussion of net effects and relative sizes of net effects of independent variables provides limited usefulness in comparison to adopting a configural (i.e., recipe or combination) perspective.

2.3.2. T_2: decision-makers rarely use all available information in all real-life cognitive processes

From a "property-space" (Lazarsfeld, 1937) or "truth table" (Ragin, 2008) perspective (i.e., identifying every theoretically possible combination of antecedent conditions) all configurations possible theoretically do not occur in practice or in behavioral pricing models. For example, the marketer considers the aggressiveness of customers' responses to price-points only for key account customers. The marketer rarely considers how aggressive the customer stands for non-key account customers (e.g., Fig. 1 does not include such a path). Customer price-lowering aggressiveness is a necessary but not sufficient condition for the customer to achieve the lowest price that the marketer is willing to offer. See Fig. 2. Such a necessary but not sufficient condition for lowering price provides valuable information for customers—being a large-requirements (volume) customer who is willing to single-source a purchase requirement with a supplier is insufficient for achieving a high membership score in the outcome condition (i.e., a very low price). In addition, such a customer needs to aggressively pursue a lower price.

Using Boolean algebra, the following configuration identifies a "causal recipe" that is sufficient for the marketer to include a very-low price-point in the response to the RFQ: K•S•A ≥ 0.70, where K = key (large volume) customer account; S = willing to single-source; and A = aggressively pursuing a price-lowering strategy. The mid-level dot ("•") represents the logical "and" condition in Boolean algebra. A sideway tilde "~" represents negation or one minus the membership score, for example, ~S = 1 − S, and represents a membership score in not being willing to single-source. The score equal to or greater than 0.80 indicates for this configuration that such customers have a high membership scores for all three of these antecedent conditions.

For a complex antecedent statement (i.e., the combination of two plus simple antecedent conditions), the total score for the statement is equal to the lowest score among the scores in the configural statement. Thus, a customer having the following scores, K = 1.00; S = 1.00; and A = 0.60 would have a membership score equal to 0.60 for K•S•A. See Fig. 3 for an XY plot that shows a pattern indicating high consistency—scores high on X associate with scores high on Y with the exception of one case—customer number 11.

Woodside and Baxter (2013) describe contexts where a very limited number of customers do not fit the general pattern of findings in a study and how to create and test alternative models to explain such instances as case 11. The note at the bottom of Fig. 3 describes additional information on case 11 and how to refine the model to account for similar cases. A configuration of high membership scores for the combination of the first three antecedent conditions was sufficient for a very low price in the Woodside and Wilson (2000) study except for one customer firm. This one customer firm (case 11 in Fig. 3) is a "contrarian case." A contrarian case is an individual (e.g., decision or firm) that has an outcome score opposite to a substantial majority of the cases with similar high

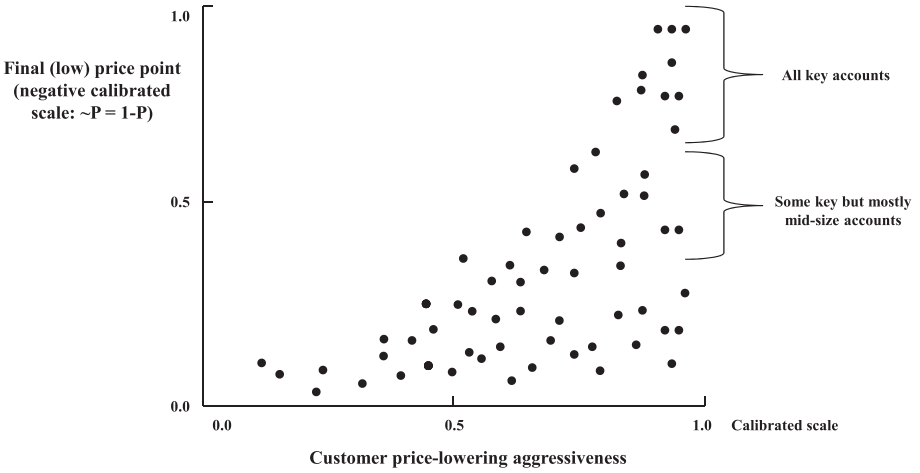

Fig. 2. XY plot of pricing antecedent condition for a necessary but not sufficient condition. Note. Each dot is a case, that is, a customer firm, plotted on the customer's price-lowering aggressiveness and the final price quoted to the customer by the marketer's firm. Data (n = 80) and plot are from additional analysis of marketer's responses to customers' requests for proposals (RFQs) and follow-up documents of customers' responses to marketer's proposals from the study by Woodside and Wilson (2000).

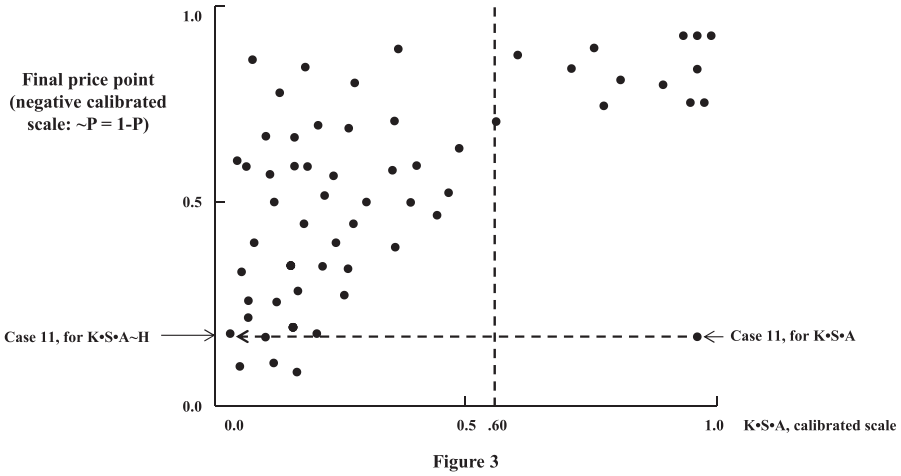

Figure 3

Fig. 3. Complex antecedent condition is sufficient but not necessary: K•S•A where K = key account; S = willingness to single-source; A = customer aggressiveness in seeking to lower price. Note. Customers with high membership scores (≥0.60) on K•S•A receive very low final price quotes with the exception of case 11. The explanation for case 11 relates to the title of Van Maanen (1978), "The Asshole." Case 11 is super-aggressive in attempting to lower price. Assuming that case 11 to be the only asshole (H), the membership scores on not an asshole (~H) for case 11 equals 0.0. Creating a configuration that includes K•S•A• ~ H serves to shift the position of case 11 on the X axis to the far left. Thus, a very complex antecedent condition is necessary to include case 11 to result in very high consistency.

scores on the antecedent condition. The presence of contrarian cases means that a researcher needs to conduct "an elaborate dialogue of ideas and evidence that leads to a progressive refinement of understanding of the relevant cases and to a more nuanced elaboration of the relevant causal conditions" (Ragin, 2000, p. 317).

Case 11 in Fig. 3 was a super-aggressive customer in demanding additional add-on concessions that the industrial marketer labeled, "an asshole" (cf. Van Maanen, 1978). Adding the condition, "not an asshole" (i.e., ~H, where the sideways tilde indicates taking the negation and "H" stands for "asshole") into the configural statement results in a shift to the far left of the XY plot for case 11 in Fig. 3 and is a useful explanation as to why case 11 did not have a high outcome associated with the three-term configural statement, K•S•A.

2.3.3. T_3: decision-makers do not trade off high accuracy for low effort but create and use algorithms that are fast, frugal, and accurate/useful in achieving their objectives

The suggestion of Powell et al. (2011) implies that individuals fail to do as well as they can do in deciding and the proposition that DMs tradeoff high accuracy to achieve low effort (Payne, Bettman, & Johnson, 1988) is inaccurate (see Gigerenzer & Brighton, 2009, for evidence and a thorough discussion of these points). Professional B2B marketers and buyers are able to create and use relatively simple heuristics to achieve high accuracy and enable these DMs to achieve their objectives more than is possible by using all the available information and statistical multivariate procedures. While individuals are limited in their conscious cognitive capacity, the available evidence does not support a conclusion of lower competence by decision makers from not using all the information available as symmetric tests as the following perspective implies:

> Research in behavioral decision theory (BDT) shows that individuals lack the cognitive capacity to make fully informed and unbiased decisions in complex environments (Kahneman, Slovic, & Tversky, 1982; Payne et al., 1988). To cope with complex judgments and decisions, people use simplifying heuristics that are prone to systematic biases. Decision makers do not maximize the subjective expected utility of total wealth, but focus on deviations from cognitive reference points. BDT has found many applications in the social sciences, including strategic management (Bazerman & Moore, 2008).
>
> [(Powell et al., 2011)]

Gigerenzer and Brighton (2009) provide an extensive review of compelling evidence that simple heuristics (i.e., simple algorithms) using limited amounts of information outperform the symmetric-based statistical models using all information available—when using holdout samples to test for predictive validity. They conclude, "Heuristics are efficient cognitive processes that ignore information. In contrast to the widely held view that less processing reduces accuracy, the study of heuristics shows that less information, computation, and time can in fact improve accuracy" (Gigerenzer & Brighton, 2009, p. 107). Morgenroth (1964) and Howard and Morgenroth (1968) describe the use of holdout samples for testing for predictive validity and the achievement of high predictive validity for parsimonious algorithms in B2B pricing decisions.

Gigerenzer and Brighton (2009) describe how, "In the 1970s, the term "heuristic" acquired a different connotation, undergoing a shift from being regarded as a method that makes computers smart to one that explains why people are not smart. Daniel Kahneman, Amos Tversky, and their collaborators published a series of experiments in which people's reasoning was interpreted as exhibiting fallacies. 'Heuristics and biases' became one phrase. It was repeatedly emphasized that heuristics are sometimes good and sometimes bad, but virtually every experiment was designed to show that people violate a law of logic, probability, or some other standard of rationality… Another negative and substantial consequence was that computational models of heuristics, such as lexicographic rules (Fishburn, 1974) and elimination-by-aspects (Tversky, 1972), became replaced by one-word labels: availability, representativeness, and anchoring. These were seen as the mind's substitutes for rational cognitive procedures. By the end of the 20th century, the use of heuristics became associated with shoddy mental software, generating three widespread misconceptions: (1) heuristics are always second-best; (2) we use heuristics only because of our cognitive limitations; (3) more information, more computation, and more time would always be better" (Gigerenzer & Brighton, 2009, p. 109).

Gigerenzer and Brighton (2009) show how multiple regression analysis (MRA) and additional symmetric statistical tests outperform simple algorithms for fit validity but the opposite holds for predictive validity (via cross-validation with holdout samples). In cross-validation a model is fitted to one half of the data and tested on the other half and vice versa. Test of sufficiency models in industrial pricing contexts support the conclusion that simple heuristics provide high validity in predicting decision choices. Given that the proof of a model's worth lies in predictive validity, algorithm models such as the model appearing in Fig. 1 need to be tested on fresh data—data not used in creating the model.

In a behavioral-pricing research example, in a study creating and using simple heuristics in a B2B pricing context, Morgenroth (1964, p. 21) reports, "To determine its predictive accuracy [of the behavioral pricing model] fresh data were introduced into the [whole pricing algorithm] model. From a series of cabinets in the office of the division one file drawer in each cabinet was haphazardly chosen. The cabinets contained pricing data and decisions of the division over a six-year period. A systematic sample of every tenth filing was taken. The filings were arranged internally in chronological order, with the date that a competitor's move was initially made (the triggering) serving as the specific criterion of order. This sample yielded 32 decisions which were compared with the decisions predicted by the model… Agreement existed in all cases tried. Hence the hypothesis that the model can predict the executive's decision was not disconfirmed by the tests."

Unfortunately, neither Morgenroth (1964) nor Woodside and Wilson (2000) provide a side-by-side comparison of MRA and QCA tests for predictive validity in B2B contexts—QCA as a tool was unavailable at the time these two studies were done. Woodside and Wilson (2000) also do not report testing for predictive validity using a holdout (fresh) sample of customer cases. Thus, the evidence supporting higher predictive validity for algorithms versus MRA models is not conclusive in the context of pricing in B2B contexts—but the studies by Gigerenzer and colleagues (Gigerenzer & Selten, 2001; Gigerenzer et al., 1999) offer consistent findings that algorithms created by biased minds provide more accurate models in predicting outcomes than the use of MRA and models that maximize subjective expected utility. Additional field studies using both symmetric (e.g., MRA) and asymmetric tests (e.g., QCA) are necessary to confirm this claim.

2.3.4. T_4: necessary but insufficient conditions (NBICs) are always present in behavioral pricing but often are unreported

Both marketers and buyers do not think to report on NBICs that researchers may find of great interest for advancing theory and practice. NBICs include antecedents that appear in a limited number of branches in an ethnographic decision tree model such as the one appearing in Fig. 1 as well as antecedents that pricing decision participants fail to mention and researchers fail to ask about. "You can't think of everything" and "we learn from our mistakes" might come to mind here; both sellers and buyers learn to include additional necessary conditions into their configural process models as mistakes surface.

Information on both types of NBICs in-use can be learned by asking participants to use "the think aloud method" (Van Someren, Barnard, & Sandberg, 1994) in responding to different highly-relevant pricing scenario-problems. Such scenario-problems can be presented to participants in the form of paragraphs and/or choice and conjoint experiments. In one instance of doing so, a buyer announced, "I would never buy from a supplier I never heard of." "Buyer awareness of the supplier" is a seemingly obvious NBIC that did not occur in the study before hearing this oral remark by a purchasing agent.

NBICs are often put forth explicitly in marketers' and buyers' documents and face-to-face statements as well as appearing without warning in long interviews. The second category of NBICs represents a form of "tacit knowledge" (Nonaka, 1994; Polanyi, 1958/2002). Tacit knowledge is unconscious and semi-conscious beliefs—"the type of knowledge that you gain through personal experience of working in an organization, but that is not written down and is difficult to share" (FT (Financial Times) Lexicon, 2013).

2.3.5. T_5: participants in setting price and responding to a price-point use neither equally weighted nor unequally weighted conditions in compensatory rules when crafting a price-point or responding to a price-point—marketers and buyers make use of conditional configural statements

Examples of the conditional statements with respect to price-points that marketers use appear in Fig. 4 and below in Fig. 7. These conditional statements refer to specific contexts and require asymmetric, rather than symmetric, tests of their efficacy, that is, for high sufficiency—whereby low outcome scores associate with both low and high outcome scores. Only high scores on the path in the statement associate with a high score for the outcome condition. A simple antecedent condition may have a statistically significant positive relationship with price for all cases while at the same time have a highly negative association with price for several individual

Configuration (Alternative path/Boolean expression)	Conditional Statement
A Path: 1 →2 → 3 → 4 = 13 reductions Boolean: K•R•S ≤ (Price ≤ -1.0)	**Lowering-price-strategy:** If a key (K) account customer who is focused on cost aggressively on lowering-price (A) and is willing to single-source (S), then price more than 35% below the annual average price.
B Path: 1→3→6→9 = 11 Boolean: K•~A•~V ≤ 11	**High-price-increase strategy:** If key (K) account customer who is **not** focused on aggressively (~A) on price reductions and **not** focused on cost avoidance (~V), then increase price 10% above the current price that K is now paying. (A rare context.)
C Path: (1→2→5→8 = 10) →15 Boolean: (~K•S•C ≤ 10) • 15)	**Signaling competitor pricing for small but important customer:** If customer is not a key account (~K) but does single source (S), but has received an RFQ response from a competitor (C), then price 1¢ below competitor's bid; observe customer's response.
D Path: 1→2→5→8 = 11 Boolean: ~K•S•~C ≤ 11	**Highest-price-increase strategy:** If customer is not a key account (~) but does single source (S) and has not received a competitor's response (~C) to an RFQ, then increase the price above the already high price by 10% that this customer is now paying.
E Path: (1→2→3→4→7 = 14) → 15 Boolean: (K•R•~S•L = 14) • 15	**Competitor-pairing pricing:** If customer is a key account (K) and is focused on cost reductions (R) but is unwilling to single-source (~S) but will split business 50-50 (L), then set new price equal to competitor's price and watch competitor's response.

Fig. 4. Examples of industrial solvent conditional pricing in alternative contexts.

cases. Consequently, studies on how participants weight the importance of simple antecedent conditions and whether or not a series of simple antecedent conditions each have a significant positive or negative influence on price are not very useful. For example, the positive impact of customer aggressiveness on lowering price changes to an apparent negative impact if the customer scores high on being an asshole. Useful, accurate interpretation of what is happening depends on focusing on multiple configurations (paths) of complex antecedent conditions.

Fig. 4 includes the main paths (i.e., configurations or recipes) that appear in Fig. 1. The findings in both Figs. 1 and 4 illustrate the tenet that a marketer may apply price-increasing and price-decreasing strategies for the same B2B product/service for different customers, strategies that do not depend exclusively on the buyers' purchase quantities—the implementation of quantity discount sizes depends on the presence and absence of additional antecedents in the configurations.

2.3.6. T_6: the average price increase or decrease across all customers provides insufficient information for advancing theory because specific price points are contingent on several complex antecedent conditions—monthly or annual prices may increase on average for most customers but decrease for a substantial minority, while some customers receive the same price quote as one given last year

Fig. 5 illustrates this sixth tenet from data in the Woodside and Wilson (2000) study. Fig. 5 shows that most customers receive price increases of varying amounts contingent on the membership score for a combination of three antecedent conditions. However, customers with high scores on all three antecedent conditions (location B in Fig. 5) receive substantial price decreases.

Customers knowing their configural location within such three- to five-sided dimensions are more likely to be more able to create effective strategies to reduce price increases or even gain price decreases than customers without such knowledge. One strategy planning take-away is that an average price increase rarely applies to all customers.

2.3.7. T_7: equifinality occurs: more than one configuration leads to the same solution (outcome), that is, a specific price-point

For example, several routes lead to outcomes 11 and 12 in Fig. 1. Behavioral pricing theory and research includes observations of usually two-to-five combinations of complex antecedent conditions that lead to the same outcome. The findings from the wholesale pricing study by Morgenroth (1964) and Howard and Morgenroth (1968) illustrate tenet 7 vividly. Fig. 6 summarizes these authors behavioral pricing model in an ethnographic decision tree diagram. The model includes three outcomes: an increase in price (top-third of Fig. 6), a price decrease (bottom two-thirds of Fig. 6) and no change in price (box 1) in Fig. 6.

Fig. 6 looks complex at first blush but examining a few paths in the model shows that such isomorphic models are easy-to-grasp. The shortest path in Fig. 6 appears at the top of Fig. 7—makes no change in our (X) price if the competitor's (O) price remains the same as our price. Price increases are less complex than price decreases in this model because the market has few competitors and demand is inelastic. Consequently, if O increases its price, then X can increase price and profits for both will increase. Thus, the second path in Fig. 7, as appearing in Fig. 6, includes boxes 1-2-3-4-5 for such a price increase by O and then by X.

Price decreases in Figs. 6 and 7 are more complex than price increases because firm X wants to limit the possibility of a price war between X and Y. Additional antecedent conditions are activated for price decreases that do not appear for price increases—such as information on the market shares for O and X in the local and nearby markets (boxes 9 and 10 in Fig. 6). This point illustrates the eighth tenet.

2.3.8. T_8: causal asymmetry occurs: the explanations for price increases are not the mirror opposites of the explanations for price decreases—different complex configurations sometimes having different simple antecedent conditions occur for different outcomes in behavioral pricing

Fiss (2011), Ragin (2008), and Woodside (2013) all stress the reality of causal asymmetry. "While a correlational understanding of causality implies causal symmetry because correlations tend to be symmetric [i.e., correlations test for symmetry]. For instance, if one were to model the inverse of high performance, then the results of a correlational analysis would be unchanged, except for the sign of the coefficients. However, a causal understanding of necessary and sufficient conditions is causally asymmetric—that is, the set of causal conditions leading to the presence of the outcome may frequently be different from the set of conditions leading to the absence of the outcome" (Fiss, 2011, p. 394).

Such findings in behavioral pricing as in Fig. 1 by Woodside and Wilson (2000) and Fig. 6 by Morgenroth (1964) and Howard and Morgenroth (1968) support the causal asymmetry stance for theory development and theory testing. Relying solely on symmetric testing tools such as MRA and structural equation modeling does not reflect the reality of asymmetric relationships in behavioral pricing. As Gigerenzer (1991) stresses, tools shape theory as well as how a researcher goes about analyzing data. Tools and theory are necessary to use that support consistent findings of causal asymmetry as well as equifinality and configural complexity (i.e., heterogeneity) in relationships among

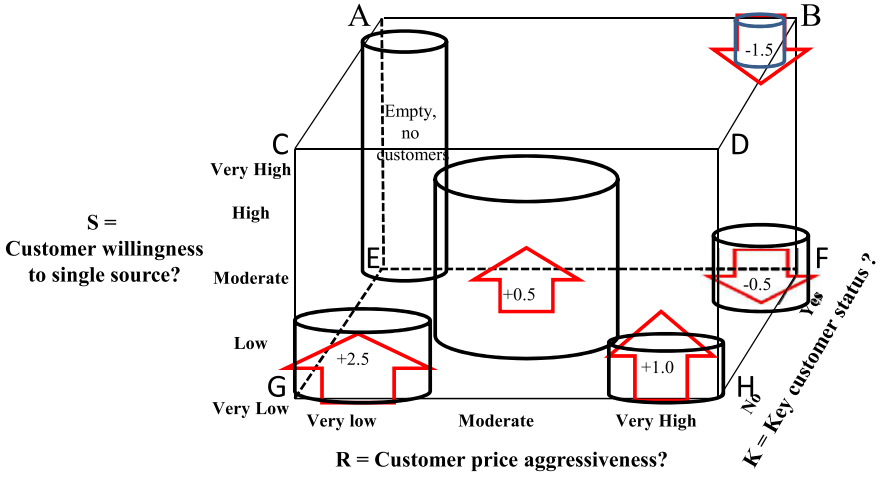

Fig. 5. Price increase and decrease points in standard units (Z-scores) with cylinders indicating number of customers (not volume of business). Notes. Most customers accept price increases. High scores in all three antecedent conditions (K•R•S) sufficient for lowest price point. Focusing on the overall average price change (Z = +0.2) is misleading because specific configurations of antecedent conditions associate with a specific price point.

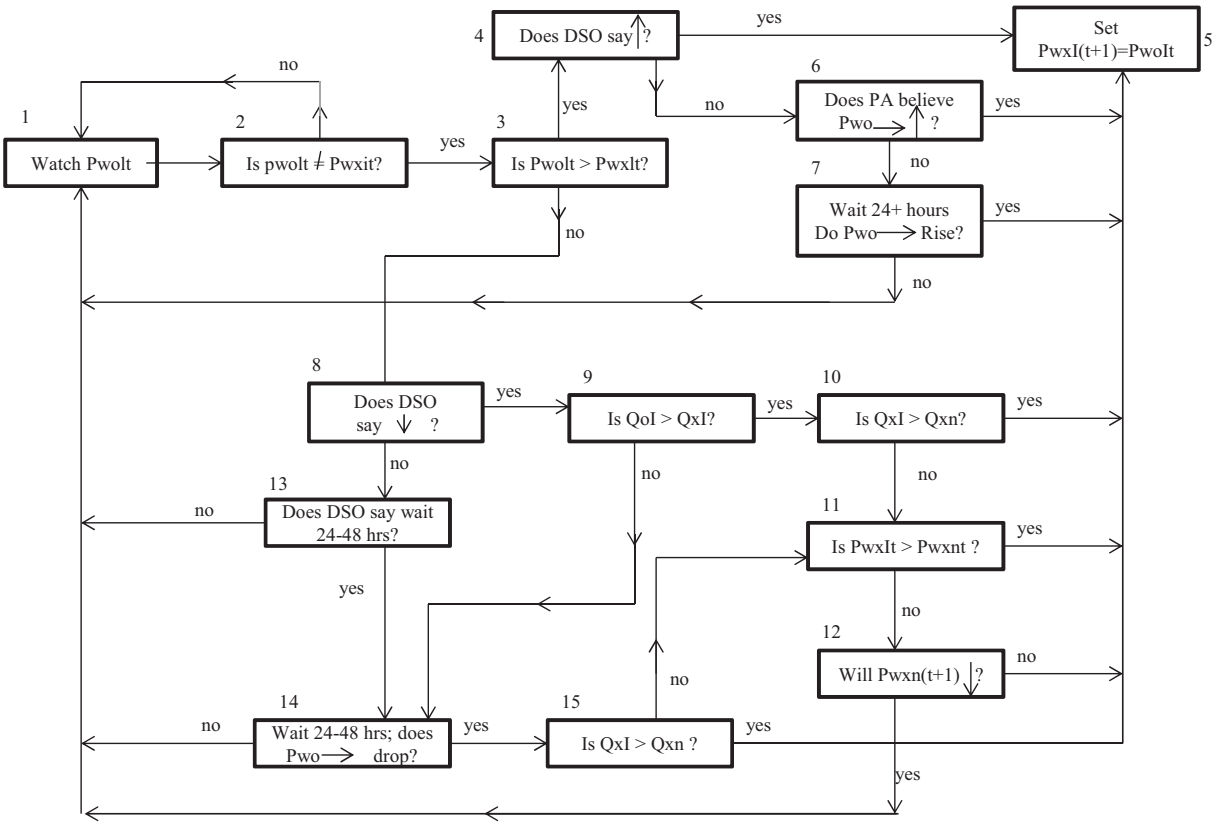

Fig. 6. Wholesale pricing of petroleum. Key. P = price; t = time, at present; PA = price analyst; r = retail; (t + l) = time, subsequent to considering price change; w = Wholesale; Q = Quantity; ≠ = is not equal to; or is different from; x = our company; l = local market, wherein price change is being considered is greater than; o = is other major competitors in local market; n = nearby market with funnel influences; ↑ = raise price; o = other major competitor initiator; DSO = district sales office; ↓ = drop price.
Source: Morgenroth (1964, p. 19).

Alternate Route	English Equivalent
A. 1 – 2 – No – 1	Watch Others' Wholesale Local price. Is it different from the Company's price? If "No", watch.
B. 1 – 2 Yes – 3 Yes – 4 Yes – 5	Another raises his Local Wholesale Price. District Sales office (DSO) says to raise price so the Company meets the price
C. 1 – 2 – Yes – 3- Yes – 4 – Yes – 5	Another raises his Local Wholesale price. DSO says not to raise price, but Price Analyst (PA) believes others may follow, so Company meets the price.
D. 1 – 2 – Yes – 4 – No – 6 – No – 7 No – 1	Another raises his price. DSO says not to raise price. PA is dubious. The company waits 24-48 hours. The other competitors follow up, so the Company meets the price.
E. 1 – 2 – Yes – 3 – Yes – 4 – No – 6 - No – 7 - 1	Same ad D, but others do not follow, so Company watches market.
F. 1 – 2- Yes – 3 – Yes – 9 – 10 – Yes – 5	Another drops his Local Wholesale Price. DSO says to follow down. The other's local market share is larger than the Company's local market share. The company's local market volume is larger than its nearby market volume. The Company meets the price.
G. 1 – 2 – Yes – 3- No – 8 – Yes – 9 - Yes- 10 – 11 – Yes 5	Same as F, except that the Company's nearby market volume is larger than its local market local market volume. The nearby market wholesale price is below the local wholesale price, so the Company meets the price.
H. 1 – 2 Yes – No – 8 – Yes – 9 – Yes 10 – No – 11 – No – 12 – 1	Same as G, except that the Company's Local Wholesale Price is below its nearby market wholesale price. This will funnel the larger market, so the Company does not change price.

Fig. 7. Example heuristics in the wholesale petroleum pricing model.
Source: Morgenroth (1964, p. 23).

antecedent conditions and outcomes of interest—such as specific price-points and price increases/decreases.

2.3.9. T_9: from a behavioral pricing perspective, two or more participants engage in interactions involving setting a specific price-point resulting in a sale/purchase

Behavioral pricing theory recognizes that B2B price setting usually involves multiple participants influencing the selection and calibration of antecedents in the pricing process. In the Morgenroth (1964) study for example, Fig. 6 shows that three persons are involved in setting price: the pricing manager, the district sales officer, and the pricing analyst. A set price is frequently negotiated between the marketer and customer. The customer frequently includes multiple-parties in B2B contexts as well (Woodside & Samuel, 1981).

2.3.10. T_{10}: price setting frequently involves a series of feedback loops in real-life contexts. Formal meetings often occur in negotiating annual contracts among manufacturers buying component parts and informal meetings both precede and follow these formal meetings

Woodside and Samuel (1981) provide a marketing-purchasing participant observation study that confirms this tenth tenet. Their study includes a decision systems analysis (DSA) showing several feedback loops in negotiation processes involving centralized purchasing offices and various plant-level purchasing officers as well as company-wide purchasing committees negotiating with global suppliers. The use of DSA is a useful precursor tool for the creation of more formal ethnographic decision tree models and the use of fuzzy set qualitative comparative analysis.

The Informant (Eichenwald, 2001) is viewable correctly as a report on a marketing anthropological study of behavioral pricing by the United States Federal Bureau of Investigation (FBI). The study includes in-depth reporting on several (in this case, illegal) meetings of competing manufacturers jointly setting prices globally for agricultural-related products with several feedback loops in discussions of the same issues. The FBI study employed a mixed-methods design. Along with unobtrusively (secretly) filming these price-setting meetings and recording verbal exchanges occurring during the meetings, the FBI analyzed thousands of price-fixing documents from several years, and completed multiple rounds of interviews with a participant observer (the informant). The result is a treasure trove that appears to support the tenth tenet—and all tenets of the general theory of behavioral pricing. T_{10} needs formal testing via separate studies comparing data from the FBI case with the behavioral pricing and classic microeconomic pricing theory.

3. Discussion with a worked example of examining complex antecedent configurations

Behavioral pricing modeling and testing has been around a while now but still such modeling is a mouse next to the dominating elephant of symmetrical theory and testing approaches in pricing research. The availability of behavioral pricing studies reporting complex configural antecedents, equifinality, and causal asymmetry is spotty in comparison to the plethora of studies by authors adopting a combination of net effects, finality, and causal symmetry stance. The principle objective of this paper is to generate the start-up of continuing behavioral pricing research that provides an annual stream of useful studies capturing heterogeneity, realism, and accurate predictive—not just fit—validity. The intention is to present a set of tenets that together offers a new reality-based behavioral pricing theory that has much promise in describing, explaining, and predicting price-related decisions and actions by marketers and buyers. The set of tenets itself includes a configuration of theory and tools.

Table 1 is a summary of comparisons of the assumptions and perspectives of microeconomics and the dominant logic theory toward pricing and decision-making (e.g., Kahneman et al., 1982; Nicholson, 2011; Perloff, 2007) versus the behavioral theory of pricing for B2B products and services. The central point in considering the comparisons in Table 1 is that while microeconomic theory and the dominant logic of research on decision-making are elegant and frequently inaccurate, the perspectives and assumptions of behavioral pricing theory are messy and frequently accurate. The general theory of behavioral pricing may offer unique advantages for attaining the objectives of heterogeneity, realism, and high-predictive accuracy.

Gladwin (1989), Morgenroth (1964), Howard and Morgenroth (1968), Van Maanen (1978), Van Someren et al. (1994), Vyas and Woodside (1984), Woodside and Samuel (1981), Woodside (2010), and Woodside, Pattinson, and Montgomery (2012) offer details and examples for collecting data from decision participants on their perceiving information, sense-making, assessing issues, and choice-making processes in natural contexts; these sources also discuss the collection of documents and data from direct observations of participants' actions in natural contexts. The blessings from such data collection and handling include the combination of verbal and written data and process information relevant to specific contexts that the use of fixed-point (e.g., 1 to 5 or 1 to 7 valuations) surveys cannot provide; also, invariably, participants blurt out information during moments in think aloud data collection procedures that they would never report in written survey responses—especially when the participants are interviewed on two or more occasions.

The bane of management ethnographic research is the great amount of effort and time necessary for implementing field data collection in behavioral pricing research. However, the data collection of 5 to 100+ such case studies enables useful construction of isomorphic models—models that support Kotler's (1967) perspective of the features of real-life decision processes in ways that symmetric models (structural equation models) using fixed-point responses cannot do. The data collection of an additional 5 to 100+ management ethnographic cases enables the testing for predictive validity of algorithms

Table 1
Comparison of perspectives of microeconomics/dominant logic and the general theory of behavioral pricing.

	Concept	Microeconomics/dominant logic	General theory of behavioral pricing
1.	Context?	Ignore	Embrace
2.	XY relationship assumption?	Symmetric	Asymmetric
3.	Stance toward complexity?	Dismiss ("all else equal")	Capture, report
4.	Research focus?	Variables; statistical models	Cases; isomorphic algorithms
5.	Focus of findings?	Net effects; fit validity only	Configurations; fit and predictive validity
6.	Theoretical stance?	Rationality	Bounded rationality
7.	View of decision-maker?	Biased; mistake prone	Biased; prone toward high accuracy
8.	Decision-maker?	Individual	Group (e.g., "buying center")
9.	Directionality	Ignore	Feedback loops
10.	Stance toward information?	Use all information available	Use all information necessary
11.	Foundation for analysis?	Matrix algebra	Boolean algebra
12.	Stance toward markets?	Many buyers and sellers	Few buyers and sellers
13.	Weighting attributes?	Yes	No
14.	Firm's principal objective?	Maximize profits	Context-bound satisficing profits

(i.e., complex configurations consisting of two or more simple antecedent conditions) within the isomorphic models created from the first set of data. McClelland (1998), Morgenroth (1964), and Howard and Morgenroth (1968) illustrate such tests for predictive validity; their findings include high predictive validities (e.g., r's > 0.90) between predictions and observed outcomes.

The blessings of collecting fixed-point survey data include the relative ease of data collection and ease of testing models using symmetric methods (MRA and SEM). The banes include requiring participants to convert what they think they know into scaled responses (the failure to collect real-life, naturally-occurring, data), the absence of contextual information, usually the absence of confirmations of facts and procedures learned by going into the field and comparing documents and observations with verbal and/or fixed-point scaled responses, and the circumspect nature of any open-ended written responses by respondents to survey questions. While surveys using fixed-point scales followed by symmetric model-building and testing may provide useful information on participants' evaluations of the quality of procedures and outcomes, such studies offer inadequate information in describing and understanding the nitty-gritty steps in the processes and provide models with low fit validity—and low predictive validity (on the rare occasions when these studies include predictive validities). The implicit suggestion by Kotler (1967) and the explicit suggestions by Mintzberg (1979) and Woodside (2013) to move beyond fixed-point surveys coupled with symmetric testing to ethnographic studies coupled with asymmetric testing have merit for model building in behavioral pricing.

3.1. Embracing complexity theory

Marketing scholars would benefit from heeding Urry's (2005) and others' (Davis, Eisenhardt, & Bingham, 2009; Popper, 1961; Simon, 2009) call to embrace many tenets of complexity theory. As Simon (2009, p. 32) states aptly, "Science seeks parsimony, not simplicity searching for pattern in phenomena." Simon (2009) refers to this perspective as one of Popper's (1961) major dictums. Both theory and Ragin's (2000, p. 317) recommendations for "elaborate dialogue of ideas and evidence" should guide searching for patterns in the data. Complex (i.e., recipes of a few to many specific levels of simple antecedent conditions) resulting in outcomes of interest is the focus of pattern search in the general theory of behavioral pricing. Given the relevancy of complexity theory and Gigerenzer's (1991) wisdom that "Scientists tools are not neutral" in behavioral pricing, fuzzy-set qualitative comparative analysis (fsQCA) is a particularly useful theory-method for explicating parsimonious patterns in pricing-related data. At the minimum, the focus and use of fsQCA in testing theory and searching for asymmetric parsimonious patterns complement the theoretical stance and use of MRA for testing for the net effects of individual variables in symmetric models (cf. Ragin, 2006).

3.2. A worked example of relevant analytics for testing the general theory

The website fsQCA.com provides a software program for testing theory and elaborate dialogues with data for identifying parsimonious patterns. The data in Table 2 and the output in Table 3 serve to illustrate the use of the fsQCA software in testing core tenets of the general theory of behavioral pricing. The data in Table 2 are based in part on data collected for the Woodside and Wilson (2000) study but the data in Table 2 are presented as a thought experiment (Gendler, 1998). All conditions (columns) in Table 2 represent calibrated data. Assume for the thought experiment that the measures have high nomological validity (our purposes here does not include a full accounting on how the measures were developed). Table 2 includes 11 conditions (8 antecedents and 3 outcomes). Applying McClelland's approach of using quintiles for each of the 8 antecedent conditions (McClelland, 1998, focuses on building algorithms of cases in the highest and lowest quintiles of variables to describe and predict highly competent individuals), a property space analysis (i.e., "truth table") indicates 32,768 possible combinations or patterns. Considering terciles (low, medium, and high) results in 512 combinations; it is best not to consider dichotomizing the conditions into high and low only due to the normal distribution for many of the simple conditions (Fitzsimons, 2008).

The data in Table 2 are fuzzy-set membership scores for each condition; fuzzy-set scores range from 0.00 to 1.00. Consider fuzzy set scores as taking steps beyond the use of quintiles whereby membership scores represent a logarithmic function of original scores. Calibration conceptually refers to a kind of membership, for example, "high price point" and not price points in general. The fsQCA software program computes all membership scores given that the researcher provides the original values associating with the full membership threshold score equal to 0.95; the original value indicating "maximum ambiguity score" equal to 0.50; and the value indicating the threshold for non-membership equal to 0.05. The median value of an original scale is usefully calibrated to be equal to 0.50. For a variable that is normally distributed, the original score having a z-score equal to +1.65 is a useful first estimate for a calibrated membership score equal to 0.95; an original score having a score of −1.65 is a useful first estimate for a calibrated membership score equal to 0.05. However, Ragin (2008) emphasizes that theory and prior experience should be the guiding forces in calibration. Consider the following data of price points in a set of 12 cases (values are U.S. dollars): 1.25; 1.30; 1.33; 1.40; 3.80; 4.50; 8.60; 11.10; 14.20; 15.10;

Table 2
Simple antecedent conditions and compound outcome of seller-offer•customer-acceptance: calibrated scales with S•O = union of S-offer and C-accept.

	ss:	so:	se:	cs:	co:	ce:	cw:	pp:	sof:	ca:	sof_ca:
Case	S-Size	S-Objective	S-Expertise	C-Size	C-Objective	C-Expertise	C-Willing	Price-Point	S-Offer	C-Accept	S•O
1	.96	.85	.97	.86	.92	.98	.74	.18	1	1	1
Case 1 description: Big, high-profit focused, expert seller; big, high-profit focused, expert customer willing to single-source, for a low price-point, both seller and customer agree on this price-point; thus, S•O = 1.											
2	.96	.95	.65	.34	.12	.77	.07	.94	1	1	1
3	.22	.99	.32	.92	.96	.40	.93	.04	1	0	0
4	.05	.91	.05	.96	.92	.99	.30	.06	0	0	0
5	.50	.20	.65	.15	.22	.05	.96	.95	1	1	1
6	.05	05	.25	.95	.60	.88	.05	.77	1	0	0
7	.61	.99	.23	.81	.19	.21	.91	.91	1	1	1
8	.96	.44	.72	.91	.60	.99	.90	.07	1	1	1
9	.31	.09	.14	.23	.08	.11	.35	.88	0	1	1
10	.91	.22	.13	.88	.99	.88	.43	.21	0	1	0
11	.56	.88	.78	.23	.86	.07	.89	.14	1	1	1
12	.96	.85	.97	.12	.30	.18	.91	.81	1	1	1

Key: S-Size = seller size for this product category; S-Objective = seller profit aggressive; S-Expertise = seller knowledge•experience•capablity; C-Size = customer size for this product category; C-Objective = customer aggressiveness for price reduction; C-expertise = customer knowledge•experience•capablity; C-Willing = customer's willingness to single source requirements; Price-Point = price point now on table; S-Offer = does seller offer this price point? C-Accept = does buyer accept this price point?

Table 3
Findings for high consistency that both parties accept.

	Models with high consistency in predicting	Raw	Unique	
	Both seller offer and buyer accepts	Coverage	Coverage	Consistency
1	pp• ~ cw• ~ ce• ~ co• ~ cs• ~ so• ~ ss	0.11	0.07	0.92
2	pp•cw• ~ ce• ~ co•cs• ~ se•so•ss	0.14	0.05	0.91
3	pp•cw• ~ ce• ~ co• ~ cs•se•so•ss	0.18	0.07	0.93
4	pp• ~ cw•ce• ~ co• ~ cs•se•so•ss	0.15	0.07	0.89
5	~pp• ~ cw• ~ ce•co•cs•se•so•ss	0.13	0.05	0.80
6	~pp•cw•ce•co•cs•se ~ so•ss	0.14	0.07	0.82
	Solution coverage: 0.51 Solution consistency: 0.93			

Example: Model 1, description: high price point, not customer willing to single source, customer low in expertise, customer's objective is not aggressive, seller low in expertise; seller size is small, seller not high profit objective, seller is not large in size.
Notes. The price point in a seller's offer that the buyer accepts is high in models 1–4 and low in models 5 and 6. The customer is willing to single source in models 2, 3, 5, and 6 but not willing to do so in models 1 and 2. The six configurations do not include one valence consistently for any of the simple antecedent conditions. Thus, the direction of the impact on price (and other simple antecedent conditions are contingent on the recipe for the complex configuration in which (and the other simple conditions) it appears.
Key: S-Size = seller size for this product category; S-Objective = seller profit aggressive; S-Expertise = seller knowledge•experience•capablity; C-Size = customer size for this product category; C-Objective = customer aggressiveness for price reduction; C-expertise = customer knowledge•experience•capablity; C-Willing = customer's willingness to single source requirements; Price-Point = price point now on table; S-Offer = does seller offer this price point? C-Accept = does buyer accept this price point?

18.10; 25.50. The pricing manager decides to calibrate these original values; the pricing manager identifies values below a breakpoint of 1.50 as clearly indicating non-membership in a high-price scale; she selects the median price equal to 6.46 as the cross-over membership score equal to 0.50, and the score of 13.0 (the upper 90th percentile limit for the mean original value equal to 9.84 as equal to full membership in high-price membership). Using the fsQCA software subroutine, here are the resulting calibrated membership scores for the 12 original prices $1.25 → 0.04; $1.30 → 0.04; $1.33 → 0.04; $1.40 → 0.04; $3.80 → 0.17; $4.50 → 0.23; $8.60 → 0.73; $11.1 → 0.89; $14.1 → 0.97; $15.1 → 0.98; $18.1 → 1.00; $25.50 → 1.00, where the numbers following the arrows indicate the calibrated scores. Note that the variability in the original values is not equally important in the calibrated membership scores; once the full membership threshold is reached, all higher values receive nearly identical membership scores—including in this instance the very high price $25.50 even though the z-score for $25.50 for a mean equal to 8.848 and a standard deviation equal to 2.314 equals 7.196. Using terciles for clarity purposes, the eight antecedent conditions provide for a truth table with 512 cells (i.e., complex configurations) that include big/medium/small, high/medium/low profit focused, high/medium/low expert seller; big/medium/small, high/medium/low profit focused, high/medium/low expert customer very/somewhat/not willing to single-source, for a high/medium/low price-point. Complexity theory, empirical findings from applying fsQCA, and elementary logic indicate that most of the 512 cells will be empty if a given study has a few or even 1000 plus cases. The outcomes include the seller only, the customer only, and both seller and customer agreeing on a contract that the particular combination represents.

The tenets of complexity theory provide several expectations to follow from examining the data in Table 2. These expectations support the following perspectives. A few (not many) of the patterns will provide highly consistent outcomes (e.g., seller-customer joint agreements). Both low and high price points within different complex antecedent configurations will associate with seller-customer joint agreements. Not all eight antecedent conditions will occur necessarily in the configurations indicating high consistency with seller-customer joint agreements. The valences for most-to-all antecedents will not be consistent for the configurations providing the highly consistent outcome of seller-customer joint agreements. A few of the combinations will provide highly consistent seller agree outcomes; a few of the combinations will provide highly consistent customer agree outcomes; such models of agreement will be distinct from the combinations indicating that both the seller and buyer agree—thus, model testing for high consistency of outcomes can and should be done for all three possible outcomes. The testing for the negation of outcomes provides for distinct models of high consistency which are not mirror opposites of the positive outcome models (the causal asymmetry tenet).

Empirically examining all the tenets of the general theory of behavioral pricing is beyond the scope of the present study. However, the configural findings for testing for seller-customer agreement using the data in Table 2 appear in Table 3. These findings include six complex antecedent conditions that associate consistently with high scores in the outcome condition, that is, high scores in each of the six models indicates high score in the outcome condition of seller-customer agreement. Positive price-points appear in four of the six complex configurations and negative price-points appear in two of them.

These findings are from the "intermediate solutions" from using the fsQCA software; these intermediate solutions include all eight antecedents—such a finding does not always occur when testing using intermediate solutions. The fsQCA output includes parsimonious solutions and complex solutions—in this example application the intermediate and complex solutions are the same. Coverage in Table 3 indicates the share of cases whereby high scores for the complex antecedent condition associates with high scores for the outcome solution—coverage is analogous to the "coefficient of determination" (R^2) in MRA (Woodside, 2013).

4. Limitations

The intention here does not include a complete exposition of the general theory of behavioral pricing. While Woodside et al. (2013) provide direct comparisons of theory and findings using symmetric versus asymmetric tools (e.g., MRA versus QCA), they do so for a field experiment focusing on pricing in a consumer goods context and not a B2B context. Certainly, direct comparisons of using both theory-method approaches in B2B contexts warrant researchers' attention. The paper's title may appear to claim too much given that the evidence is limited in support of the general theory. However, the presentation here focuses on developing the theory and to call for the use of marketing and consumer anthropological studies focusing on the tenets of behavioral pricing to test the general theory. One objective for the study here is to encourage additional research and literature reviews on behavioral pricing topics to both confirm and extend the core tenets of the theory.

The general theory of behavioral pricing as explicated here fits well in Cyert and March's (1963) four objectives for starting the quest for a behavioral theory of the firm. Here are the four objectives as Cyert and March expressed in 1962:

1. Focus on a small number of key economic decisions made by the firm. In the first instance, these were price and output decisions; subsequently they included internal allocation and market strategy decisions.
2. Develop process-oriented models of the firm. That is, we viewed decisions of the firm as the result of a well defined sequence of behaviors in that firm; we wished to study the decisions by studying the process.
3. Link models of the firm as closely as possible to empirical observations of both the decision output and the process structure of actual business organizations. The models were to be both explicitly based on observations of firms and subject to empirical test against the actual behavior of identifiable firms.
4. Develop a theory with generality beyond the specific firms studied. We wanted a set of summary concepts and relations that could be used to understand the behavior of a variety of organizations in a

variety of decision situations (Cyert & March, 1963, p. 2, italics in original).

Yet, the present study is limited in its scope and depth in contributing to these four objectives. The present paper provides an approach to constructing and testing complex antecedent conditions that builds upon the objectives of the behavioral theory of the firm and complexity theory but does not provide a full empirical examination that matches the four commitments as Cyert and March (1963) describe. Clearly the tenets of the general theory of behavioral pricing need examination by field studies involving more than one marketer and only a limited number of cases of customers. However, the advances of joining complexity theory, complex configural modeling, and the tenets of the basic behavioral theory of the firm provide insight for a useful way forward.

5. Practical implications

Famously, Kotler (1967, p. 1) pronounced, "Marketing decisions must he made in the context of insufficient information about processes that are dynamic, nonlinear, lagged, stochastic, interactive, and downright difficult." Kotler's perspective is relevant to pricing decisions and customers' responses to specific price points as well as to advancing knowledge in behavioral pricing.

Consequently, research on issues involving pricing decision processes and outcomes in industrial marketing contexts requires the use of methods that go beyond arms-length surveys using fixed-point scales. The Morgenroth (1964), Howard and Morgenroth (1968) and the Woodside and Wilson (2000) studies included multiple face-to-face interviews with multiple participants in the pricing decision processes, document analysis of several cases (decisions), and in the study by Woodside and Wilson (2000) interviews with customers as well as members of the industrial marketing firm. The data analysis benefitted by the use of asymmetric analytical tools as McClelland (1998) and Ragin (2008). The findings support the tenets of the general theory of behavioral pricing as described in the present article.

5.1. One antecedent condition is rarely sufficient as an indicator for a high or low outcome score

Reviewing the tenets of the theory and empirical findings offers strategic insights for both marketers (M) and customers (C). An insight for both M and C that follows from the first tenet: very large customer size alone is insufficient for offering or receiving price-points lower than the average price point for all customers. B2B customers need to call attention to their size when aggressively pursuing a low price-point.

5.2. Decision-makers rarely use all available information in real-life contexts

An insight for M from the second tenet: different information streams relevant for different customer segments results in modifications to marketing strategy designs for these different customer segments. Customers can be segmented by a combination of size and the decision processes that they enact. For C: what works for big customers in the industry in gaining favored price treatment with suppliers is unlikely to work with small customers. Small customers will need to enact decision processes relevant for their size to gain favored treatment from suppliers.

5.3. Decision-makers do not tradeoff high accuracy for low effort but create and use algorithms

Woodside and Wilson (2000) describe purchasing executives reporting the use of compensatory decision rules for information gathering purposes but not when making actual choices among suppliers and their responses to RFQs—buyers use algorithms. Their conscious explication of these algorithms is likely to be a valuable exercise in learning how well the algorithms serve to reach their buying objectives. For M, learning buyers' algorithms-in-use will likely impact how M designs RFQ responses and the effectiveness of these responses in gaining share-of-business from the customers.

5.4. Learning necessary but insufficient conditions (NBICs)

M and C are likely not to be consciously aware of all relevant necessary but insufficient conditions affecting the setting of price and responses to price-points. The in-depth study of multiple cases using the long interview method is likely a necessary requirement for uncovering such information—such was the case in learning the seemingly trivial information that not all customers were aware of all three national manufacturers of the chemical purchasing requirements in the study by Woodside and Wilson (2000).

5.5. Prices vary considerably for different customers in the same industry but the variance occurs in different complex configurations-in-use by their industrial suppliers

The wide variation in prices for the same company manufacturing commodities in the chemical industry in Woodside and Wilson's (2000) study might surprise many industrial buyers. The low price among all customers was one-tenth of the highest prices that some customers were paying for the same products. Part, but not all, of this price variance would relate to costs in servicing large versus small customer accounts. Small-order customers are at a considerable disadvantage in attempting to negotiate price reductions with manufacturers of their purchase requirements. However, a share of large customers would likely benefit from an increase in their aggressiveness in negotiating price reductions. The cases were rare whereby large customers were too aggressive for the manufacturer to comply with requests for additional price reductions and additional add-on benefits (shipments with very low transportation charges)—compliance to such requests was usually granted.

6. Conclusion

Behavioral pricing modeling and testing have been around for a while now but still such modeling is a mouse next to the dominating elephant of symmetrical theory and testing approaches in pricing research. The availability of behavioral pricing studies reporting complex configural antecedents, equifinality, and causal asymmetry is spotty in comparison to the plethora of studies by authors adopting a combination of net effects, finality, and causal symmetry stance. The principle objective of this paper is to generate the start-up of continuing behavioral pricing research that provides an annual stream of useful studies capturing heterogeneity, realism, and accurate predictive—not only fit—validity. The intention is to present a set of tenets that together offers a new reality-based behavioral pricing theory that has much promise in describing, explaining, and predicting price-related decisions and actions by marketers and buyers. The set of tenets itself includes a configuration of theory and tools. Table 1 is a summary of comparisons of the assumptions and perspectives of microeconomics and the dominant logic theory toward pricing and decision-making (e.g., Kahneman, 1982; Nicholson, 2011; Perloff, 2007) versus the behavioral theory of pricing for B2B products and services. The central point in considering the comparisons in Table 1 is that while microeconomic theory and the dominant logic of research on decision-making are elegant and frequently inaccurate, the perspectives and assumptions of behavioral pricing theory are messy and frequently accurate. The general theory of behavioral pricing may offer unique advantages for attaining the objectives of heterogeneity, realism, and high-predictive accuracy. Gladwin (1989), Morgenroth (1964), Howard and Morgenroth

(1968), Van Maanen, (1978), Van Someren, Barnard, & Sandberg, (1994), Vyas and Woodside (1984), Woodside and Samuel (1981), Woodside (2010), and Woodside, Pattinson, and Montgomery (2012) offer details and examples for collecting data from decision participants on their perceiving information, sense-making, assessing issues, and choice-making processes in natural contexts; these sources also discuss the collection of documents and data from direct observations of participants' actions in natural contexts. The blessings from such data collection and handling include the combination of verbal and written data and process information relevant to specific contexts that the use of fixed-point (e.g., 1 to 5 or 1 to 7 valuations) surveys cannot provide; also, invariable, participants blurt-out information during moments in think aloud data collection procedures that they would never report in written survey responses—especially when the participants are interviewed on two or more occasions. The bane of management ethnographic research is the great amount of effort and time necessary for implementing field data collection in behavioral pricing research. However, the data collection of 5 to 100+ such case studies enables useful construction of isomorphic models—models that support Kotler's (1967) perspective of the features of real-life decision processes in ways that symmetric models (structural equation models) using fixed-point responses cannot do. The data collection of an additional 5 to 100+ management ethnographic cases enables the testing for predictive validity of algorithms (i.e., complex configurations consisting of two or more simple antecedent conditions) within the isomorphic models created from the first set of data. McClelland (1998), Morgenroth (1964), and Howard and Morgenroth (1968) illustrate such tests for predictive validity; their findings include high predictive validities (e.g., r's > 0.90) between predictions and observed outcomes. The blessings of collecting fixed-point survey data include the relative ease of data collection and ease of testing models using symmetric methods (MRA and SEM). The banes include requiring participants to convert what they think they know into scaled responses (the failure to collect real-life, naturally-occurring, data), the absence of contextual information, usually the absence of confirmations of facts and procedures learned by going into the field and comparing documents and observations with verbal and/or fix-point scaled responses, and the circumspect nature of any open-ended written responses by respondents to survey questions. While surveys using fix-point scales followed by symmetric model-building and testing may provide useful information on participants' evaluations of the quality of procedures and outcomes, such studies offer inadequate information in describing and understanding the nitty-gritty steps in the processes and provide models with low fit validity—and low predictive validity (on the rare occasions when these studies include predictive validities). The implicit suggestion by Kotler (1967) and the explicit suggestions by Mintzberg, (1979) and Woodside (2013) to move beyond fixed-point surveys coupled with symmetric testing to ethnographic studies coupled with asymmetric testing have merit for model building in behavioral pricing.

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Organizational and institutional barriers to value-based pricing in industrial relationships

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ABSTRACT

In their effort to differentiate themselves from cost-driven rivals, many industrial companies are beginning to serve their customers through value-based offerings. Such companies often engage actively in collaborative value creation with their customers. To capture a fair share of the value created, they need to adopt a value-based pricing approach. Therefore, value-driven competition necessitates value-based pricing (VBP). The present study explores the barriers to exercising value-based pricing and suggests ways to overcome those obstacles in putting value-based pricing into action in B2B sales. The study is implemented as an exploratory multi-case study applying an abductive research methodology. Our cases show that industrial sellers try to understand and influence their customers' desired value perception, influence customer-perceived value (CPV), and improve their bargaining position as means to overcome these barriers to improved value capture. Hence, our findings deepen the current understanding of value-based pricing in industrial buyer–seller relationships. In doing so, it contributes to the literature on customer value, organizational capabilities, business models, and sales management in previously unexplored areas. Moreover, the study provides guidance to business practitioners willing to develop value-based pricing as part of their business model.

1. Introduction

Research on business-to-business (B2B) marketing stresses the importance of pricing for every firm's profitability and long-term survival (Lancioni, 2005). Hinterhuber and Liozu (2012) emphasize that price setting requires discipline and should be congruent with other aspects of a firm's marketing strategy. Commoditization of offerings in mature markets and pronounced buyer power might drive price setters toward competition-based pricing or cost-based pricing (Farjoun, 2002; Ingenbleek, Debruyne, Frambach, & Verhallen, 2003), and lead to below-target profitability (Nagle & Holden, 2002). Hence, many industrial firms strive to renew their business models by increasing the number of value-adding activities in their offering portfolios. This renewal fundamentally affects their customer approach and emphasizes customer-perceived value (CPV) as the basis of their business strategies. Previous research suggests that while CPV is generally acknowledged as a necessary basis for business strategy, alone it is not sufficient for capturing value (Bowman & Ambrosini, 2000). Moreover, Blois and Ramirez (2006, 1027) argued that "although firms exist to help customers and organizations to create value, they only do so in order to capture part of that value for themselves."

As more firms adopt value-based business strategies, there is a call for a better understanding of the constituents of a pricing approach to support value capture (Monroe, 2002). Value-based pricing (VBP) is a potentially powerful tool to capture a fair share of the value created (Hinterhuber, 2004, 2008b). Previous research generally holds value-based pricing as a superior method for profit maximization (e.g., Monroe, 2002), and competitive advantage (Dutta, Zbaracki, & Bergen, 2003). However, there seem to be major obstacles in putting value-based pricing into action in business markets. Hinterhuber (2008a) reports that in many surveys of pricing approaches across industries, value-based pricing accounts on average for only 17% of the investigated pricing approaches. Among the reasons why VBP is employed so infrequently is that it features complicated customer specificity, which creates obstacles for marketers. VBP has been described as a sophisticated but complicated approach to pricing in business markets (e.g., Forbis & Mehta, 1981). It uses customer-perceived value as a pricing reference (while cost-based pricing refers to supplier cost, and competition- or market-based approaches link pricing to market prices). CPV-based pricing calls for understanding the sources, dimensions, and outcomes of value. In addition, using CPV as the reference necessitates the assessment of customer value and communication about it with customers. Hence, the following questions are posed: What are the barriers to value-based pricing in B2B relationships? How can suppliers overcome those barriers?

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The purpose of the present study is to explore the barriers to exercising VBP in industrial buyer–supplier relationships, and suggest ways by which sellers can potentially overcome the barriers to adopting VBP for improved value capture. Through an empirical inquiry consisting of a multiple case study approach we analyze companies that have pursued VBP as part of their marketing strategy. Our study is linked to the academic discourse of buyer–seller relationships and builds on the notion that business relationships should be of value to all participants. Wilson and Jantrania (1994, 63) point out that a major issue in the life of a relationship pertains to how value is shared between partners, submitting that "the greater the value created, the greater the issues in sharing the value."

The remainder of this paper is structured as follows. The next section provides a conceptualization of customer-perceived value, value exchange, and value-based pricing to deepen the current understanding of the constituents of customer-perceived value as the basis for value-based pricing. Section 3 describes the research process and the methods used to gather data. The analysis reported in Section 4 follows the abductive research method of a systematic integration of empirical and theoretical knowledge (Dubois & Gadde, 2002) by presenting the findings with links to the relevant literature. The final section discusses the implications for research and practice, synthesizing factors that may impede the use of VBP and behaviors that facilitate it. In addition, we discuss the limitations of the study and suggest some opportunities for future research.

2. Customer-perceived value, value exchange, and value-based pricing

2.1. Conceptualization of customer-perceived value

In the literature, the creation of customer value is linked with achieving high business performance (Blois & Ramirez, 2006; Gosselin & Bauwen, 2006), long-term success, and survival (Eggert, Ulaga, & Schultz, 2006). Value has a number of attributes. *Value is subjectively evaluated*. It is perceived distinctly by customers (Ramirez, 1999; Vargo & Lusch, 2004). *Value is context-specific*. Customers judge the value in their specific use context (Kowalkowski, 2011), based on the customer's specific business situation, guided by institutional constraints (Zucker, 1987), and behavioral influences (Cyert & March, 1992). The *perception of value is dynamic*. The customer's perception of value may change over time in terms of both the relative importance and the business impact of different facets of value (Flint, Woodruff, & Gardial, 2002). *Value is multi-faceted*. The literature suggests different taxonomies of value, emphasizing, for example, the economic, strategic, and behavioral dimensions (Wilson & Jantrania, 1994); economic, technical, service, and social (Anderson, Jain, & Chintagunta, 1993), or product, service, know-how, time-to-market, and social (Ulaga & Eggert, 2005). The source of value can be a product, a relationship, or the network in which the relationship is embedded, or all of these (Lindgreen & Wynstra, 2005). These attributes of value influence the value perceived by the customer and, hence, influence value-based pricing.

Anderson et al. (1993) define value in business markets as the perceived worth in monetary units of the set of economic, technical, service, and social benefits received by a customer firm in exchange for the price paid for a product offering, taking into consideration the available alternative suppliers' offerings and prices. While, in addition to product-related value, this definition recognizes some elements of relationship-related value, Ulaga and Eggert (2005) defined customer value in business relationships as the trade-off among product, service, know-how, time-to-market, and social benefits, as well as price and process costs in a supplier relationship, as perceived by key decision makers in the customer's organization and taking into consideration the available alternative supplier relationships. Drawing on the above definitions, we define customer value as a four-dimensional construct: *Customer-perceived value is the difference between perceived benefits received and perceived sacrifices made by a customer. Both benefits and sacrifices are multi-dimensional concepts, combining operational, strategic, social, and symbolic dimensions of value*.

The conceptual framework identifies four *dimensions* of customer value: strategic, operational, social, and symbolic. Of note, economic indicators are not among the dimensions of customer value. Instead, economic measures focus on the outcome of customer value-based approaches in terms of operational performance or future-oriented catalysts of change (March & Sutton, 1997). The economic *outcome* is affected by a change in one or more of the following economic performance indicators: an increase in revenue, a higher profit margin (by a decrease in lifecycle cost of operation), a reduced risk of the expected economic outcomes (by improved stability of the operation), or a more efficient use of resources (such as better return on capital invested or more efficient use or process inputs) (e.g., Vitasek et al., 2012).

2.1.1. Operational value

The *operational dimension* of value pertains to the operational performance of a company, and affects processes within the organization and at the organizational boundaries, toward customers and partners. Operational value results in lower operational costs or higher output value, or both.

Operational value is manifested as improved processes, improved process integration, and higher offering value. Processes are improved by better capabilities, resource efficiency, and process input improvements. Suppliers contribute directly to operational value with improved products and components featuring fitness for purpose, conformance, performance, and reliability (Ulaga & Eggert, 2005), product features, and ease of handling (Ritter & Walter, 2012). Relationship-related contributions affect operational performance through knowledge, process development, process outsourcing, process integration, cooperation efficiency, and risk avoidance (Hunter, Kasouf, Celuch, & Curry, 2004). Suppliers may also significantly increase the value of the customer's own offering (Brandenburger & Nalebuff, 1996). Achieving operational benefits incurs adaptation sacrifices, including process changes, competence development, installation, and integration (Ravald & Grönroos, 1996). Operational sacrifices are determined by the total cost of ownership (Anderson, Wouters, & Rossum, 2010; Ferrin & Plank, 2002). Relationship-incurred operational sacrifices include the risk of not actually receiving the benefits due to delays, failures, false promises, and other factors relating to future realization of the value. Relationships also incur governance and relationship management costs.

2.1.2. Strategic value

The *strategic dimension* of value pertains to organizational change and survival. Strategic value involves leveraging existing capabilities or developing new capabilities through learning, know-how (Ulaga & Eggert, 2005), and innovation. Developing new capabilities and absorbing them from the external environment both support innovation for the future. Organizational learning in inter-organizational relationships may have long-haul and strategic benefits through the acquisition of skills and capabilities that improve environmental adaptation (March, 1991). Relationship-related strategic sacrifices include the erosion of own capabilities (Ritter & Walter, 2012), inability to adopt inputs (Cohen & Levinthal, 1990), unhealthy dependency (Williamson, 1991), lock-in, and a potential leaking of proprietary knowledge and intellectual property rights, with rising costs and lost competitive advantage as a result.

2.1.3. Social value

Participation in a supplier relationship or network can influence the external status of a customer in a wider business network by inclusion in a high-image network, prestigious community or strategic alliance (Kothandaraman & Wilson, 2001) bringing, for example, improved legitimacy (Suchman, 1995). The potential benefits include lower cost

of new customer acquisition and improved retention of existing customers by improved market access (Ritter & Walter, 2012), as well as reference value. The wider network-related social and structural bonds (e.g., Wilson & Jantrania, 1994) support learning and innovation by providing access to information (Ritter & Walter, 2012). At the relationship level, social bonds and trust and cultural fitness (Wilson & Jantrania, 1994) reduce cooperation and relationship-governance costs. Flexibility and solidarity (Lapierre, 2000) soften the impact of market dynamics. Managing a network, or choosing an ecosystem brings an opportunity cost and reputational risk, and the wrong choice can pose a threat to survival

2.1.4. Symbolic value

Goods, business relationships and networks can create symbolic value. Symbolic value is manifested as the internal motivation pride, and job satisfaction. It may even contribute to increased productivity, improved retention, and overall workforce performance (Ritter & Walter, 2012). Research in the sociology of culture suggests that goods and relationships carry a symbolic value to the extent that they provide users with an outlet to express individual identity, and a possibility to signal social status (Ravasi & Rindova, 2008). Part of such symbolic value is social, but it also has a contingency aspect and can be seen to carry an emotional charge.

2.2. Value exchange

In business markets, firms exchange value during relational processes by receiving benefits and making sacrifices. The primary motivation to exchange comes from trading *perceived use value* against *exchange value* (Bowman & Ambrosini, 2000). The customer receives benefits from the supplier and makes supplier-related sacrifices (including exchange value) during the relationship, both benefits and sacrifices consisting of the different dimensions of value. Both parties must perceive the benefits received as exceeding the sacrifices made (Khalifa, 2004). Both the customer and the supplier also receive benefits and sacrifices, which are not directly related to the exchange, including network-related and indirect relationship benefits and sacrifices. Influential stakeholders on both sides subjectively evaluate the different dimensions of value for their value capture potential, by weighing benefits against sacrifices, assessing the risks, and deciding for or against the exchange. All of the customer-perceived value dimensions inform and influence the decision-making.

2.3. Value-based pricing

The available range to determine the price between the supplier cost and the buyer-perceived value (Forbis & Mehta, 1981; Kortge & Okonkwo, 1993) is illustrated in Fig. 1. The customer's willingness to pay (e.g., Brandenburger & Stuart, 1996) is limited by the perceived net benefits: "Benefits are net benefits, where any costs that the customer firm incurs in obtaining the sought benefits, apart from purchase price, are included" (Anderson & Wynstra, 2010, 31). The customer-perceived value is the difference between the perceived net benefits and price paid. Correspondingly, suppliers make no profit by selling below their cost.[1] Hence, price is determined within the range (Kortge & Okonkwo, 1993) indicated, and the price determines how value created is shared between the parties.

Literature identifies three main pricing approaches: cost-based, competition-based, and value-based pricing (Hinterhuber, 2008a), which use supplier costs, prevailing market prices, or customer value as the pricing reference, respectively. Hinterhuber (2008b, 42) defines value-based pricing based on the value that a product or service delivers

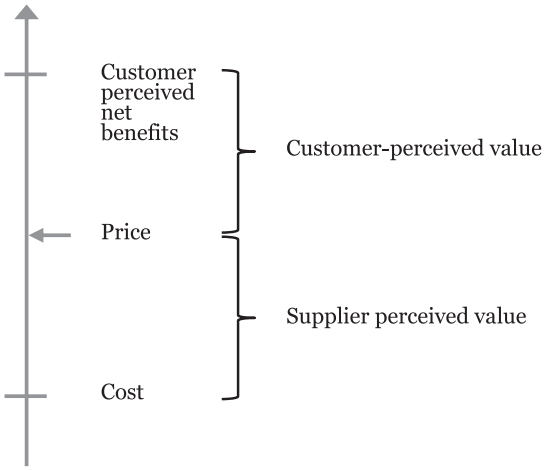

Fig. 1. Price in relation with customer-perceived value and supplier cost.

to a predefined segment of customers as the main factor for setting prices. As a pricing reference, customer-perceived value is a moving target. The context-specific and dynamic nature of value leads into different evaluation of value in different business situations, and at different times. The customer's perception of value is denoted as customer-desired value (Flint et al., 2002), which describes the customer's value perception and scope, what are the desired end-states of value, and which value dimensions are included in the customer perception of value. Those perceptions are subjective, differing and difficult to predict. Hence, value-based pricing can be difficult to implement: Previous research identifies value assessment, communication, segmentation, sales force management, and top management support as some of the obstacles to implementing value-based pricing (Hinterhuber, 2008a).

3. Methodology

While research of value in B2B marketing is extensive, empirical research on the implementation of value-based pricing is still rather nascent (Liozu & Hinterhuber, 2013), calling for an exploratory approach. We also followed the recommendations of Eisenhardt (1989) and Yin (2009) and the examples of existing exploratory cases (such as Storbacka, 2011) in using multiple cases. Based on the rationale that our multiple firms are in various stages of the value-based business and service transformation, the cases allow for a more comprehensive analysis to support our aim of developing a holistic view of influence factors and to compare the approaches and processes of distinct firms. In addition, the multi-case approach opens diverse insights beyond the limited contexts of single firms in single industries and broadens the generalizability of the findings. The research process follows that of abductive research (Dubois & Gadde, 2002), pursuing a systematic combination of theoretical knowledge and insights gained from our empirical inquiry.

3.1. Case selection and data collection

The five focal companies in this study are prominent firms with global operations in multiple industries. A key criterion for each firm's participation was that it was undergoing a transformation in its strategic focus away from a goods-dominant to a service-dominant logic (Gebauer, 2008). The firms engaged in a large-scale research program in which we studied the future of industrial services as well as the future of sales management. A summary of the participating firms is provided in Table 1.

[1] Brandenburger and Stuart (1996) provide a more detailed discussion related to the supplier cost. They label the cost as "opportunity cost" and provide a mechanism for determining the opportunity cost.

Table 1
Case description (sales and staff numbers 2012).

Firm	Industry	Value-based sales and pricing initiative	Sales €Mil.	Staff
Alpha	Global mineral processing company	Enterprise-wide transformation to value-based businesses with investment in competence development in value-based selling and pricing.	2087	4805
Beta	Leading paper industry technology and service provider	Comprehensive initiative focusing on value quantification, value sales, value pricing competence.	7504	30,212
Gamma	Lifts and escalators	Global development and training programs on value selling skills and tools for the sales organization.	6277	39,851
Delta	Bearings, lubrication systems, and services	On-going value selling program (10 yrs) as a central part of long-term value-based business development investments, with emphasis on total cost of ownership methodologies.	7494	44,168
Epsilon	Power plants	On-going development of value-based sales quantification mechanisms.	4700	18,900

In each of the companies, service accounts for an increasing share of sales and profits, but in varying degrees. Both the articulated aim to transform their business toward value-based strategies and the increasing importance of value-based pricing approach provide a strong rationale for the selection of these firms. Each firm screened and enlisted key informants with the background and experience to inform the firm's service transformation. To provide a broader understanding of the investigated phenomenon, companies were selected at various stages of the transformation. The variety of firms was believed to ensure a richer understanding, from multiple lenses, of the forces, effects, and process changes required, and provide us with a rich set of contexts to study new and evolving issues in the value-based pricing capabilities of industrial organizations. The selected cases cover a broad range of activities and the linkages between those activities from the nascent transformation toward value-based business to more advanced integration of value-based business strategies and value-based pricing.

Data collection and analysis took place over a 16-month period in 2012–2013. The research was conducted in five stages. We began the study by performing an extensive bibliographic review of multiple topics in the customer value literature across pricing, marketing, strategy, organizational buying, and sales domains. The *second stage* comprised five initial interviews with participants from two companies (Alpha and Beta). During the *third stage*, empirical insights from the other three companies were collected along with follow-up interviews with Alpha and Beta representatives to assess the validity and connections of these additional insights. A multi-method and multi-respondent data collection procedure was used to acquire primary data and secondary archival data (e.g., corporate documents, sales materials, value calculators, and templates). Purposive sampling and semi-structured interview strategies were used (Eisenhardt, 1989; Yin, 2009), lasting between 60 and 120 min, and adapting interview contents based on previous interviews. The number of people interviewed from each participating company ranged from 2 to 20 with a total of 47 informants interviewed in the study. All interviewees were provided anonymity. The interviews were conducted with members of various levels of the case organizations, including senior executives, salespeople, functional specialists, factory managers, product managers, value program managers, country managers, pricing managers, category managers, and industry experts. Consistent with the abductive research strategy, our focus in the interviews was directed toward uncovering new insights not evident in earlier interviews or empirical findings. The interviewed industry experts were consultants and former managers, currently active in industry organizations and research. Most initial interviews were conducted in face-to-face, with follow-ups by telephone and e-mail. With limited exceptions, interviews were recorded and transcribed verbatim. Researchers took copious field notes that were included in the analysis. We continued with the interviews in each company until we reached a point of saturation where redundant information began to appear frequently (Corbin & Strauss, 2007).

In addition to semi-structured interviews with the case organizations, the data collection included a *fourth stage* of special interest group workshops attended by Alpha, Beta, Gamma, and Delta. Insights gained from the workshops were used to verify the relevance of the interview themes. During the benchmarking workshops, the company representatives presented and discussed themes related to (1) distinctive value propositions, (2) value-based procurement, (3) value quantification tools, (4) value implementation, (5) quantification of intangible value, and (6) value-based pricing. The workshops were conducted between late 2012 and mid-2013, lasting 4 h each and resulting in a significant volume of field notes, presentation materials, and documentation for the present research. During the *fifth stage* key findings related to value-based pricing alone were discussed with pricing experts from Beta, Gamma, and Epsilon to verify and fine-tune the findings.

3.2. Data analysis

Data analysis was conducted throughout the data collection by manually converting the data to discrete but connected blocks and openly coding the contents. Although the boundaries between the phenomenon and its context are not always evident in a case study, we followed Gummesson's (2000) guidelines to derive general conclusions from a limited number of observations. The early and ongoing analyses allowed the researchers to track emerging themes more easily and to find patterns in those themes. This analysis also enabled us to establish an analytical framework, which was modified as new information was added. New themes and contradictions were useful in exploring the nuances of respondents' contingency factors and their company's evolution in developing their value-based business models in the distinct contexts. As multiple sources of data and respondent data were included, findings were compared among the researchers and against prior knowledge. Finally, the analysis included follow-up discussions to verify and calibrate the findings.

Several strategies were used to assess the reliability and validity of the findings. Following established procedures in the literature (e.g., Yin, 2009) and similar empirical studies (for example, Flint et al., 2002; Storbacka, 2011), we applied a multi-case replication logic to incorporate multiple experts and key informants to participate in a review of the data and analysis. In so doing, we maintained strong triangulation. The multiple inputs also assisted us in determining saturation in synthesizing the findings, as multiple insights are generally considered more reliable than the observations of a single researcher.

We paid special attention to ensuring that the reported observations accurately represent the data. At the same time, we considered validity in terms of how well the findings fit the relevant concerns in the substantive area under investigation. We took care to keep the validity of data in mind when selecting the cases to generate a complete picture of the area of interest. After the initial analyses, we consulted the informants to confirm the extent to which the descriptions truly represented their views of the reality. In this respect, the interviewees were offered preliminary findings and asked to comment on them and verify the accuracy of the interpretations. Many industry representatives from different professions, such as consultants, sales executives and managing directors reviewed and verified the results.

Several iterations of research team review meetings were held as the data were analyzed and synthesized before arriving at the reported findings. In this process, the findings were reviewed, discussed, and triangulated multiple times with the key informants and experts. We made our best effort to reduce researcher bias when interpreting the findings. To this end, three researchers conducted separate analyses and co-researchers then independently reviewed the analyses and findings. In addition, several representatives of the case organizations and experts in the field audited the results in the later stage of the process. This process preserved the integrity of the analysis by mitigating the risk of interpretations being influenced by misinformation or evasion by participants. The interviews were professional and anonymous, and the informants were selected to ensure knowledge and experience.

Transferability of findings is always an issue in empirical research. It culminates in the extent to which findings from one study in one context will apply to other contexts. Our sample of informants covered multiple positions, management levels, and business units within focal companies investigated in this research. The interviews were performed in different industries, including the areas of information and communication technology and medical technology. Moreover, the extent to which the findings are unique to time and place influences the stability and consistency of explanations. The cases selected for this study represent multiple phases of the value-focusing business strategy transformation processes. In the analysis process, we focused on those cross-company findings that were highly consistent among firms whose value-based pricing was at a similar stage of maturity.

Finally, because the generalizability of findings is a major concern in qualitative research (e.g., Lukka & Kasanen, 1995) we pursued multiple aspects of the phenomenon. In so doing, we selected five separate case studies from different industries and at different stages of development. The interviews lasted, on average, more than an hour and included open-ended questions to capture insights from a broader perspective. The interviewees were chosen to represent a variety of perspectives on the topic. In regard to controlling these issues, the informants were invited to comment on the theoretical suggestions.

4. Empirical findings

Based on the prevailing knowledge on value-based pricing and on the analysis of our empirical cases, we identify and analyze three institutional barriers to implementing value-based pricing. The first barrier involves the need for understanding and influencing the customer's desired value. The second barrier is described as the problem of quantifying and communicating value in buyer–seller relationships to influence customer-perceived value. The third barrier to value-based pricing features challenges in value capture.

We structure our investigation of how supplier's seek to establish the customer-perceived net benefits as a pricing reference by analyzing how our case companies (1) identify and influence the customer-desired value, (2) influence customer-perceived value, and (3) capture a share of the value created in the exchange. In each of these categories, our study identifies a number of impediments to the application of value-based pricing. In the following sections, we analyze the influences and antecedents to value-based pricing from a supplier perspective by presenting the impediments, challenges and pre-requisites. We illustrate the findings by reporting examples from the case companies, and link the essential findings with the literature.

4.1. Understanding and influencing customer-desired value

4.1.1. Barriers to understanding and influencing customer-desired value

Over time, industrial companies have built governance structures, belief systems, associated rules and norms, which guide and constrain attention, decision criteria, buying, and procurement. These institutionalized logics were established under different market conditions and may not serve the interests of value maximization in networked, relational exchange. To illustrate this point, the case companies repeatedly expressed frustration with the conflicting notions of value between the buyer and the seller:

> After presenting to a group of senior industrial buyers, a senior executive commented, "their conception of total-cost-of-ownership includes item price and delivery cost".
>
> [Delta]

The desired value is determined by stakeholders (Johnston & Bonoma, 1981) with multiple and conflicting goals and ambitions (Cyert & March, 1992) and varying levels of power (Eisenhardt & Zbaracki, 1992). Their career history, cognition, and past experience influence their desired value perceptions with their attention limited by local search behavior (March, 1991) and selective attention. Decision makers learn through imitation and benchmarking (Cohen & Levinthal, 1990; March & Sutton, 1997; March, 1991), tending to generate shared attention within an industry. Their behavior and receptivity are guided and limited by social and institutional norms and rules (Zucker, 1987) and legitimated beliefs (e.g., Suchman, 1995).

While value-based business relationships appear to provide a win/win model for arranging exchange, there is a strong industrial culture favoring aggressive buying with a focus on the initial transaction price. This culture is deeply rooted in procurement institutions, rules, norms, and organizational inertia that resist the adoption of value-based practices.

> "This is a conservative industry. People in factories are generally focusing on daily production, and are reluctant to change anything that works. We also observe how different the ways of running a factory are at different continents, and we do not see those practices converging".
>
> [Beta]

The identified reasons for deviating from desired value perceptions include: (1) Buyer's desired value perceptions are determined by the somewhat outdated industrial beliefs, building on transactional supplier relations and commoditized goods exchange; (2) the organizational governance process that allocates incentives for buyers produces sub-optimal goals; (3) there is a goal conflict between individual decision-makers and the organization. Adding to the challenge, the prevailing industrial procurement processes (4) engage with suppliers late in the buying process, leaving no room or receptivity to influence the customer's value perceptions.

4.1.1.1. No access to influence. Influencing desired value perceptions is often imperative for the successful application of VBP. Our data shows that industrial buyers sometimes choose among alternatives based on the initial purchase price, which is unlikely to favor suppliers that focus on optimizing more holistic measures of business performance. Influencing requires access to power. Relationship maturity and a partnering approach to the supplier relationship management (Kraljic, 1983) facilitate access to influence. Supplier category management may prevent access from companies that are deemed non-strategic commodity suppliers.

4.1.1.2. Limited receptivity. Customer managers are more accustomed to price than they are to value, leading to comparative ignorance about value relative to price (Anderson & Wynstra, 2010; Fox & Tversky, 1995). Monroe (2002) argues that customers value a reduction in sacrifices more highly than an increase in benefits. Evidence from industrial procurement suggests that procurement knowledge on value-based concepts, such as the total-cost-of-ownership, is limited (Ferrin & Plank, 2002), and buyers may have difficulties absorbing the message (Cohen & Levinthal, 1990). In addition, industrial imitation tends to generate shared attention within an industry and directs stakeholder interest to salient issues, making it harder for the seller to create interest

if the seller's value proposition does not resonate with the current topics on the management agenda.

4.1.1.3. Goal conflict. In terms of how organizational incentives are defined and distributed within the organizational governance model, the individual decision-maker goals and incentives may not increase the value created. "Each functional area does what is best for it, but not necessarily what is best for the firm as a whole" (Anderson & Wynstra, 2010, 25). Procurement may be rewarded for price savings, which actually hurt the overall business performance through increasing total cost of ownership. Sub-optimal incentives encourage local rationality.

> "We have this one case from 2009 when our procurement made a deal to purchase inexpensive sealings. Our technicians then ended up travelling around the world to replace those after a while"
>
> [Delta]

> "I have been let to understand that procurement managers have bonus plans that reward reducing direct procurement costs including consumables, spare parts, and energy. The savings achieved are often not favorable long-term".
>
> [Beta]

Consistent with Lindgreen and Wynstra (2005), we find that buyers might sometimes be reluctant to choose the offer with the highest delivered value for a number of reasons. First, the buyer might operate under instructions to buy at the lowest purchase price and is prevented from making a choice based on perceived value. Second, the buyer might want to maximize the short-term personal benefits and thus will not appreciate long-haul value. Third, the buyer may enjoy a long-term relationship with a particular supplier, which may have led to lock-in effects and high switching costs if the supplier is changed. This implies that the buyer must be convinced of the long-haul benefits provided by the supplier to be successful in selling. Fourth, even if it is evident that the seller's value offer would be beneficial for an organization, the goal alignment between individual goals and incentives, together with the organizational goals, determine the desirability of the event for the individual actors. Drawing on the behavioral theory of the firm (Cyert & March, 1992), rational, efficiency maximizing organizational goals may not be aligned with the individual goals and aspirations of the organizational actors. "The goals of a business firm are a series of more-or-less independent constraints imposed on the organization through a process of bargaining among potential coalition members and elaborated over time in response to short-run pressures" (Cyert & March, 1992, 50). Alignment of conflicting goals is especially relevant in the organizational setting studied in this article: "Selling solutions is a complex exercise that involves the consideration of conflicting requirements of multiple stakeholders in a customer organization" (Tuli, Kohli, & Bharadwaj, 2007, 14).

4.1.1.4. Too late to influence. Influencing the definition and scope of the evaluation criteria requires access to influential buyers at the early stages of their buying process (e.g., Eades, 2004), before the evaluation criteria are set and the evaluation stage of the buying process commences (cf., Adamson, Dixon, & Toman, 2012; Rackham & DeVincentis, 1999). However, in the mature industrial business markets, sales-based influencing is often reactive. Customers determine their change needs, compile solution requirements, and then contact potential suppliers with ready-made specifications and decision criteria, with an embedded value conception. The late engagement in the buying process leaves very little room to influence the value conceptions. In the final stages of the buying process, buyers resort to increasingly competitive (and adversarial) procurement practices, making different decision alternatives comparable by decomposing solutions to comparable elements, applying bidding contests and reverse auctions to bargain, often with a strong focus on the initial investment cost (Hunter et al., 2004).

4.1.2. Identified solutions for understanding, influencing, and aligning value perceptions

4.1.2.1. Methods to understand customer-desired value. Customer value audits (Ulaga & Chacour, 2001), customer value analysis (Miles, 1972), and customer value research (Anderson, Kumar, & Narus, 2007; Bettencourt & Ulwick, 2008) all represent approaches that reveal how the business processes are run, and how value could be created by improving business performance. Anderson et al. (2007) and Bettencourt and Ulwick (2008) describe techniques for performing value analysis. The case companies spend time with their customers to build awareness of their value preferences.

> "Having identified key stakeholder groups, we set out to analyze the individual stakeholder processes, building an intranet resource of stakeholder processes, and describing stakeholder goals and challenges to guide segment specific value proposition development. Two years ago we did an exercise to describe the processes, and I personally did (describe the) builder and architect … different steps in the process and challenges".
>
> [Gamma]

> "We are trying to holistically understand our customer's processes, the different flows of material and money, to understand how our products affect their business performance in different economic cycles".
>
> [Alpha]

4.1.2.2. Influencing customer-desired value at the early stages of a buying process. Influencing value perceptions requires proactive marketing and selling before and during the early stages of the customer's investment and buying processes (e.g., Berghman, Matthyssens, & Vandenbempt, 2006). Our findings about the importance of early engagement with a buying process are largely consistent with the notion of Terho, Haas, Eggert, and Ulaga (2012), who find that value-based selling is still rather an innovative approach and largely requires proactive marketing and sales to influence carefully selected receptive buyers. Vitasek et al. (2012) show that typical tools include whitepapers, seminars, books, industrial benchmarking studies, and substantiated reference stories.

> We have had a value manager over a decade to actively influence procurement organizations by delivering seminars, attending procurement association's summits, writing books and whitepapers, and supporting research.
>
> [Delta]

4.2. Influencing CPV by value quantification and communication

Once a shared conception of value has been achieved, quantified evidence of value is critically important in influencing CPV (Anderson, Narus, & van Rossum, 2006; Hinterhuber, 2004), in order to establish the CPV as a value-based reference point for pricing. Value quantification involves (1) selecting an appealing economic outcome as an aggregate measure of value created (the case companies frequently promote a reduction in total cost of ownership), (2) select salient value dimensions of value in the quantification exercise, in line with the previous step of achieving a shared conception of value, (3) establish the (functional) relationship between the salient value dimensions and the value measure, (4) establish a baseline situation for every salient value dimension by auditing the current situation, (5) determine the achievable performance level for every value dimension, (6) calculate the aggregate impact on the value measure (e.g., Anderson et al., 2006), and finally, (7) communicate value by involving the customer in the process (Anderson et al., 2007).

Value quantification is generally a major challenge for industrial companies (Storbacka, 2011). The case companies report mixed results from their value quantification attempts. Quantification can fail at any stage during the quantification process. The parties may fail to agree on the salient dimensions of value; the baseline situation may be inaccessible, or the customer could be unwilling to share the data due to the lack of trust, the customer may be reluctant to engage in the quantification exercise, the calculation of value may be difficult, or the end result may not be credible.

4.2.1. Salient dimensions of value

Our findings suggest that industrial companies still use only a subset of potential dimensions of value elements in their approach to quantify customer value. Our interviews with the senior managers in the sellers' organizations indicated that this is mainly attributable to the sellers' responsiveness to buyers' behaviors, as well as the institutionalized norms of value selling approaches within the seller's businesses. Only the operational dimension of value is systematically quantified and leveraged as a basis of VBP, even though it is evident from previous research that buyers are evaluating the other strategic, social and symbolic dimensions in their decision making.

4.2.2. Access to baseline data

Congruent with the findings of Grönroos and Helle (2010, 576), we found that firms are faced with significant practical challenges in getting access to essential data on the elements needed for quantification of value of the offerings for the customers. Trust, confidentiality, rivalry, and similar factors may prevent the gathering of the necessary numbers to perform value quantification.

> "Few factories have good systems to collect the data. They are also sometimes jealous about the data, thinking that it may benefit competition".
>
> [Beta]

To overcome these issues, many of the case companies are furnishing their installed equipment base with sensors to collect production and performance data and use this information in advanced services and equipment modernization recommendations through value quantification and verification.

4.2.3. Lack of trust

Lack of trust and credibility discourages decision makers from sharing essential information such as production data, making value quantification difficult or impossible (e.g., Grönroos & Helle, 2010). The contribution of a supplier's offering to a company's value creation process significantly influences the relationship that the company is willing to enter into with the supplier (Kraljic, 1983; Van Weele, 2009).

4.2.4. Reluctance to quantify value

Pretended ignorance of value or reluctance to evaluate value in anticipation that undesired value would be discovered may occur when customers pretend that sellers could then leverage that information for a higher price. This may be the case "if they [the sellers] believe they can negotiate a better deal by appearing indifferent to benefits" (Smith & Nagle, 2002, 20).

4.2.5. Value function

Value quantification generally requires capability to establish the functional rule from operational parameters to customer's key performance indicators, such as total cost of ownership. Woodruff (1997) describes a process of generating such means–end calculation rule. An example of such a top-down process of value-quantification is a DuPont analysis (e.g., Soliman, 2004). The case companies Alpha, Beta, Delta, Gamma and Epsilon successfully produce quantified evidence to support value-based pricing. Alpha motivates industrial equipment modernizations by calculating how much customer profit is impacted by improved mineral recovery, reduced maintenance costs, and lower energy costs in a flotation process. Beta calculates the savings resulting from a longer lifecycle of roll surfaces. Gamma can show the savings of using their people transportation equipment during construction time, instead of specialized additional equipment. Epsilon can compare power plant investment alternatives by calculating the customer-specific cost of producing electricity over the lifecycle of a power plant. Some of these calculations are relatively straightforward equipment-level comparisons, but some require specialized production knowledge.

4.3. Capturing a share of the value created

4.3.1. Barriers to capturing value

Once the value has been agreed upon, created, and quantified, the remaining challenge is to determine how the value is shared between the parties. Capturing a fair share of the value created requires overcoming the institutionalized barriers of cost-based pricing, managing the uncertainty in value creation, and building a strong bargaining position.

4.3.1.1. Established cost-based pricing and perceived fairness. Our findings reveal that customers are seldom prepared to share the value evenly, despite a convincing proof of value. A senior executive from Alpha stated, "we can charge high cost-based prices by demonstrating value". For industrial buyers, a cost-based price is generally "right". The industrial exchange is characterized by repetitive buying, competitive alternatives, and high buyer power. The cost-based pricing has become an institutionalized norm over time, and deviating from the norm is not appealing:

> "Our customer on the west coast had a number of leaking valves in a paper mill. They were losing about a million in a year because of this. We devised a solution for this and offered to solve the problem and tie our compensation to the actual savings made. To our surprise, they declined. We later found out that they felt that the deal would have been too good for us".
>
> [Beta]

The quotation from Beta illustrates a situation in which criteria other than purely utility maximization were driving the decision-making. Perceived fairness influences decisions (Xia, Monroe, & Cox, 2004). The Ultimatum Game (see Sanfey, Rilling, Aronson, Nystrom, & Cohen, 2003, p. 1755) provides a salient explanation for the behavior.

4.3.1.2. Value at risk. Value is often created over a longer period of time with an inherent risk of failure. Anderson and Wynstra (2010) address value from the perspective of customers who are concerned about whether their businesses will actually realize the cost savings or are able to capture the incremental revenue and profits that suppliers claim for their offerings. Wilson (1995) suggests that personal risk of failure is among the key sacrifices feared by individual stakeholders, dramatically reducing the perceived value of an offering.

> "We have found it especially difficult to introduce new products in Asia due to perceived risk of losing face in case something goes wrong. This industry is conservative, and the attitude is not to fix it if it is working".
>
> [Beta]

Value-based pricing generally requires monitoring value creation through periodic value verification. Value verification is costly and in itself risky. One method of value-based pricing employs bonus payments when predefined goals have been achieved. Evidence from the case companies reveals that customers are generally hesitant or unable to deal with bonus payments for reasons relating to budgetary processes and similar governance structures. Generally, a temporal distance

between benefits and sacrifices creates complications. Not all value-based pricing allows tracking of the value created, either:

> "We would like to limit dynamically tracking value to larger deals, because of the cost and burden".
>
> [Beta]

> "If the value generated by a product is low, we still want to communicate the value, but apply a fixed price to keep it simple".
>
> [Alpha]

Apart from value verification, Anderson and Wynstra (2010, 29) find that "reference customers and pilot programs appear to be equally effective as value evidence in reducing ambiguity about superior value".

Another challenge identified by the case companies was to manage the customer-induced risks in the mutual value-creation process. Potential remedies include factoring the risks into pricing (Storbacka, 2011) or by gaining control of the shared processes by outsourcing. On the other hand, information asymmetry and incomplete understanding of the customer's value creating process presents a major outsourcing challenge.

4.3.2. Influencing value sharing from a position of strength

Ultimately, successful value-based pricing requires bargaining power (e.g., Bowman & Ambrosini, 2000; Emerson, 1962). Bargaining power is the relative ability of the exchange parties to influence how the value is shared. Bargaining operates within the range from supplier cost to net benefits (Fig. 1) and bargaining power determines who captures the value. Regardless of how much value a supplier contributes, or how critical the supplier's role is in creating the value, the supplier can still capture a minuscule amount of exchange value, if their bargaining power is weak (Bowman & Ambrosini, 2000). Professional buying is likely to seek the best possible deal by leveraging procurement and negotiation tactics (Raiffa, 1982) to capture a higher share of the value created. The prerequisites for VBP discussed—achieving a shared conception of value, quantifying value to influence CPV, overcoming the institutional barriers of fair sharing of value, and finding ways to manage the value at risk—are among the fundamental methods of building a strong position.

4.3.2.1. Exclude alternatives. Effective application of value-based pricing requires at least a temporary monopoly for a solution. Comparability and competitive bidding quickly drive prices toward competition-based pricing, in which the customer captures the majority of the value created.

> "We already for quite some time had a product, <omitted>, which reduced waste from 8% to approximately 3%. We priced the equipment based on the realized savings only. We did not sell modernizations or anything; the only choice was to buy the equipment. Competition eventually managed to work around our patents, and we lost our price premium".
>
> [Beta]

Identified mechanisms to achieve a temporary monopoly include solution differentiation and making decomposing the solution difficult to avoid comparability, and to avoid the cost as a pricing reference by selling services instead of products.

4.3.2.2. Hide cost. Some of our case companies (whose identities are withheld for the nature of the statement) avoid revealing their cost to avoid establishing the cost as a pricing reference and aim to bargain from a position of strength. In such cases, a negotiating position can be seen as an antecedent to value-based pricing.

4.2.2.3. Relationship value matters. Finally, aggressive bargaining is destructive for a relationship. Winning a bargaining contest is likely to destroy supplier motivation, joint innovation, integration efficiencies, formation of social and structural bonds, and other forms of relationship value. Therefore, long-term relationship value discourages the use of one's negotiating position for short-term benefit. Buyers may perceive a long-term partnership as preferable to aggressive bargaining and arms-length relationship, requiring that the buyer's vendor management policy recognizes the value of the relationship (Kraljic, 1983).

5. Conclusions and implications

Value-based pricing is mounting as value-based strategies are amplified in the business and management discourse, and there is a need to develop a matching pricing approach that supports value capture. Overall, the present study aimed to deepen the current understanding of the application of customer-perceived value in a B2B setting. Specifically, we provide a conceptualization of the dimensions of customer value and findings on their manifestation in practice and focus on understanding the barriers to VBP in buyer–seller relationships. Our analysis provides a critical perspective of how B2B firms utilize customer-perceived value as the reference in their pricing approach. Following Ulaga and Chacour (2001), our investigation centered on customers' judgments of business value, taking into account both perceived benefits and sacrifices.

5.1. Synthesis of findings

Our study identified three institutional barriers to value-based pricing: 1) understanding and influencing the customer's desired value, 2) quantifying and communicating value in buyer–seller relationships, and 3) challenges in capturing a share of the value created in industrial exchange. Overcoming the two first-mentioned barriers necessitate the establishment value as a pricing reference. Regarding the third barrier, our findings emphasize that capturing a share of the value created in industrial exchange calls for bargaining power in the buyer–seller relationship. Moreover, our analysis shows that overcoming each of these barriers is a multi-faceted issue accompanied by several challenges.

The combination of theoretical knowledge and empirical insights gained from our cases provided an important observation: value-based pricing in an industrial setting focuses almost solely on the operational dimension of value. While the other three dimensions of value (strategic, social and symbolic) were found to influence decision-making, only the operational benefits and sacrifices seem to be considered explicitly when determining the pricing range illustrated in Fig. 1. Contributing to the body of knowledge of implementing VBP in industrial exchange, our investigation focused on how price is determined within that range.

We found that buyers often wish to establish the supplier's cost as a pricing reference, while our data highlights that the supplier's main goal is to establish the customer-perceived net benefits as a pricing reference (Fig. 1). Buyers increasingly apply aggressive procurement practices to push the price toward the supplier's cost. Also, buyers may want to decompose offerings to comparable elements, find competitive alternatives, and arrange bidding contests and similar tools to build their negotiating position. The case companies reported the use of sophisticated, IT-based methods of revealing the supplier's cost in order to provide evidence that the buyers are more effective in establishing the supplier cost as a pricing reference than the sellers are in establishing the perceived value as a pricing reference. In comparison with the value-based approach to pricing investigated herein, competition-based market prices generally provide a middle-ground pricing reference for commoditized offerings as it does not necessarily require cost or benefits analysis, but reflects the power balance among the suppliers and customers.

Unlike much of the literature, our study addressed customer-perceived value from a holistic perspective, including the dimensions and outcomes of value, and relating value to the different constituents of the value exchange. Based on our data, the identified sources of

value include product-related sources, such as performance enhancements or improved reliability; relationship-related sources pertaining to cooperation efficiency and scope, and the potential for gaining new capabilities from a partner by learning from cooperation. Understanding the sources of value may help managers in both assessing and creating value. However, there are sacrifices that hamper the value gained through an exchange. For example, collaboration within a network of autonomous actors may cause transaction costs to rise higher than that of operating with the closest and known partners. Our analysis underscores the importance of addressing these issues in value research, which should precede price setting.

5.2. Theoretical implications

While the present study is based on a qualitative exploration of value-based pricing, the findings reinforce the role of pricing as a crucial element of marketing strategy. Managers in business markets today seek to deliver superior value to customers and gain a fair share of that value through pricing. The present study provides two key contributions to this discourse: A holistic conceptualization of customer-perceived value and an analysis of how sellers try to overcome the challenges in pursuing value-based pricing to improve value capture.

First, we conceptualized customer-perceived value as the basis for value-based business strategies. Building on the earlier conceptualizations of value (e.g., Ulaga & Eggert, 2005) in the existing body of scientific knowledge, the present study goes beyond what is earlier understood of value in business markets. Moreover, we consider the impact of value on organizational performance and the ways that they lead to the economic outcomes. Contributing to future analyses of value creation and capture, the present study classifies customers' value drivers into four dimensions including the 1) strategic, 2) operational, 3) social, and 4) symbolic aspects of value. The present study suggests that an analysis of the perceived changes in these value dimensions contributes to the understanding of the impact of value creating activities on the sellers' and customers' current and future performance. In doing so, it distinguishes the essential dimensions of customer-perceived value from the economic outcomes of value. The outcomes were identified in terms of 1) revenues, 2) costs, 3) resource efficiency and 4) risks. The suggested conceptualization has implications for building theories about the role of value-based pricing in marketing strategies.

Second, the present study investigated how value-based pricing facilitates value captured among business-to-business sellers. In concordance with Liozu and Hinterhuber (2013), we consider value-based pricing as an organizational capability. By investing in the development of such capabilities, value-focusing marketers need to forge a shared vision, a collective can-do mentality (Liozu and Hinterhuber (2013)), and managerial practices supporting the value-based approach that leads to superior levels of organizational efficacy. Theoretically, a key task then for managers is to decide what aspects of customer-perceived value to focus upon in order to differentiate their business in the marketplace (O'Cass & Ngo, 2012), based on the understanding of what value their customers seek. The present study contributes to this discussion by providing a cognitive model of quantifying value for value-based pricing through a function of perceived benefits and sacrifices.

Yet another interesting finding which surfaced from the analysis, which may prove valuable in the future development of theoretical explanations of the implementation of VBP is that for either party, relationship related value, which is unknown to the other party, might exist. For example, a supplier may value a symbolic or social value resulting from a relationship, such as increased legitimacy, much higher than the direct economic value resulting from the exchange. Therefore, future theories of B2B pricing should take a broader range of value dimensions into account in explaining value-based pricing than just the operational and strategic ones that are currently employed by the mainstream practitioners.

Contributing to the literature of the implementation of VBP in industrial exchange, our analysis unravels institutional barriers that may impede the utilization of customer-perceived value as the pricing reference in B2B relationships. These include the seller's limited understanding of the aspects of value that are important to the buyer, buying practices that may obscure value-based buying and other contingencies of the buyer–seller relationship, such as commonness of the value propositions. We also identified some ways in which firms have increased the use of customer-perceived value in pricing. Among the most imperative ones seem to be behaviors that are associated with increased customer orientation for better understanding of customer-desired value, and the focus on lifecycle value instead of the short-term spread of benefits and sacrifices. On that front, we found that sellers who strive to implement VBP try to avoid bargaining about the short-term value to increase the likelihood of gaining from the long-haul benefits of the relationship. Moreover, advanced use of VBP takes the stakeholders' desired value into account, including not only the traditionally addressed operational and strategic aspects, but also the social and symbolic aspects of value. These findings underscore the need to develop further explanations on the contingencies that influence the application of value-based pricing in practice.

5.3. Managerial implications

In this article, we show that understanding how customers perceive value in business-to-business exchange can help sellers develop their pricing capability. For managers, the implication is clear: systematic development and management of capabilities and practices for value-based pricing enable the implementation of value-based business strategies. This is imperative to economic performance, as price setting directly affects the revenue streams of a company. Pricing of products and services is a challenging managerial task because it requires special knowledge and capabilities. In particular, successful value-based pricing depends on one's knowledge about customers' desired value perceptions. The results of this study suggest that sellers should analyze their customers' desired value in all the four identified dimensions to understand how the customers perceive the different sources of value, and take measures to improve customers' overall value perception.

The present study identified eleven challenges to the application of value-based pricing and analyzed how the investigated case companies have tried to overcome them in their customer relationships. The managerial implication is relatively straightforward; each of these eleven challenges requires attention, and in most cases requires the development of new capabilities and practices. The challenges faced in value-based pricing and ways that companies have tried to overcome them, as identified in our study, are summarized in Table 2.

The findings indicate that an assessment of customers' perceptions of the relative importance of value in its different dimensions should help marketing managers to quantify the perceived value for more effective pricing. Of course, credibility of the value quantification is affected by the controllability of the factors not included in the value analysis.

Congruent with earlier research (e.g., Hinterhuber, 2008b), we identified the difficulties related to obtaining and interpreting data on customer perceptions and communicating the considerations of value between the customer and the seller. Consistent with the findings of Kortge and Okonkwo (1993), we see that managers must collect detailed micro-information for the implementation of value-based pricing in practice. Such information includes past experiences of the suppliers' and competitors' prices and perceptions of product quality, delivery process, and service experience. In this vein, determining value often includes benchmarking analyses.

Among the identified challenges is the fit between pricing objectives and tactical level considerations. In our data, differences between marketing strategies and pricing policies are observable. Many of the case organizations have an articulated strategy to create increased value for

Table 2
Identified barriers in VBP and ways that companies have overcome them.

Actions	Barriers	Measures taken
Understanding and influencing customer-desired value	▪ No access to influence value perceptions ▪ Limited receptivity ▪ Goal conflicts ▪ Too late to influence	▪ Development of ways to understand desired value perceptions ▪ Influencing desired value at the early stages of a buying process
Influencing CPV by quantifying and communicating value	▪ Emphasis on salient dimension of value ▪ Access to baseline data, ▪ Lack of trust ▪ Reluctance to quantify ▪ Value function not known	▪ Systematic quantification and communication of value
Sharing the value—capturing a fair share of the value created	▪ Established cost-based pricing and perceived fairness ▪ Value at risk (risks related to the realization of desired outcomes)	▪ Influencing value sharing from a position of strength (by excluding alternatives, hiding costs and emphasizing relationship value)

the customers, but do not systematically use the important dimensions of value as the basis of pricing. We discovered that only the operational dimension of value is systematically quantified and leveraged as a basis of VBP, even though it is evident from previous research that buyers are including the other strategic, social and symbolic dimensions in their desired value perceptions, and evaluating those as part of their decision making. Often the focus is on short-term operational gains, which are easier to quantify, and are salient and resonating for the industrial buyers. The strategic, social, and symbolic elements of value are seldom an active and explicit part of the exchange. Again, the prevailing norms, normative pressures (e.g., Wiener, 1982) and beliefs may be among the reasons that constrain the use of a broader set of aspects of customer's value perception as the basis of pricing. Our empirical findings suggest that in order to include other than operational dimensions of customer-perceived value, sellers need to demonstrate the value in a broader scope than with just operational benefits. Communication of the strategic, social, and symbolic aspects of value, by respecting the institutional constraints, provides a basis for gradually effectuating an institutional change toward value-based practices in pricing.

Finally, our analysis highlights that many industrial companies aim to implement value-based business strategies. Many of the companies are developing organizational capabilities that support their value-driven activities, such as value-based selling, solution-based business models, and value-based pricing. Building on what has been previously argued about value capture and stakeholder bargaining power (e.g., Coff, 1999), it appears that without successfully remedying the obstacles identified in our study, industrial sellers cannot build power to benefit from the value created and their customers are likely to capture a major share of the value created. Hence, our findings endorse the previous finding that investments in value capabilities are likely making suppliers more attractive, but do not necessarily make them more profitable (c.f., Gebauer, Fleisch, & Friedli, 2005).

5.4. Limitations and future research directions

Our study suffers from several limitations, concurrently pointing to potential avenues for future research. First, considering the exploratory nature of our research, there is a need to validate these findings in further research. To this end, future research should review the conceptualization of customer-perceived value as the basis of value-based pricing. In particular, as suggested earlier by Ulaga and Chacour (2001), our findings give rise to suggest that customer-perceived value should be measured as a multi-attribute construct. Likewise, different industries and markets may reflect distinct institutional and behavioral constraints that play a role in value-based pricing practice. Understanding these constraints can help sellers to support their marketing strategies through successful pricing and capture more value with their marketing activities.

Second, we suggest that pricing should be studied as part of firms' business models. This is because business models make a central theme in the marketing management literature and offer marketing researchers a fresh perspective on key marketing elements. A fruitful area for empirical investigation is the alignment of a firm's pricing approach with other elements of the business model. In particular, substantial opportunities exist for researching the use of value-based pricing for fostering the performance of business models. Specifically, the interconnection between value-based pricing and value-based selling activities requires further investigation. One such activity is the customer-specific bundling of offerings for individual pricing (Simon & Butscher, 2001). While modular product and service architectures are employed more than ever in firms' business models, the implementation of modular offerings as the basis of individual pricing requires further investigation. Third, several constraints to pricing deserve further investigation. For instance, in the previous research in marketing, one could observe multiple examples of firms using contracts to manage inter-organizational exchange (e.g., Wuyts & Geyskens, 2005). In some cases, contracts make an important institutional setting for pricing, thereby underscoring the importance of contracts as institutional factors that affect pricing decisions.

In addition, in the present study, the perceptions of value were investigated in a multiple-case study setting. However, for consistency in the empirical inquiry, the data were collected from five case organizations representing globally operating manufacturers of investment goods and related services in the metal and engineering industries. Moreover, it is possible that different aspects of value-based pricing will be emphasized in different cultural, geographical, or industry contexts. Therefore, although we have paid special attention to assessing the reliability of our findings, we call for more research to complement and validate the findings in other industries and in cultural and geographical areas.

Finally, there is a need to investigate value-based guidance of buying beyond what was done in this study. In addition, the effects of profitability incentives on price perceptions in the buyer organizations require more attention. Hence, we call for more research on how value-based thinking may change procurement practices. Increasing the customer perspective to a value based approach can help companies instill an increasingly fact-based decision-making process to value-based pricing.

6. Closing remarks

This article contributes to the emerging research on value-based exchange. In our recent paper on value-based selling in *Industrial Marketing Management* (see Töytäri & Rajala, 2015: Value-based selling: An organizational capability perspective), we investigate the organizational capabilities that contribute to the value-based strategy implementation in the context of industrial business-to-business sales. For a broader view of value-based exchange and strategy implementation, please refer to that paper, too. The present paper sheds more light on the challenges associated with value-based pricing in buyer–supplier relationships and investigates the actions taken in sales organizations to cope with these challenges.

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Violations of rational choice principles in pricing decisions

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ABSTRACT

Research on behavioral and psychological aspects of pricing is concerned with violations of rationality. This paper presents a comprehensive overview of the current literature by highlighting those studies that have specific relevance for industrial pricing. I hereby examine two different perspectives. First, by taking the customer perspective, I analyze under which circumstances customer purchase decisions violate basic principles of rational choice. Second, by taking the perspective of managers, I examine which biases affect the process of price setting within firms. This overview meaningfully advances industrial pricing theory and practice: It allows both customers and managers to guard themselves against widely diffused traps in decision making. It also enables managers to favorably influence customer perceptions of value and price without actually changing the price. Finally, by pulling together a number of different research areas into a more parsimonious framework and a tighter narrative, this framework offers systematic directions for future research.

1. Introduction

What are central research questions that fall within the domain of behavioral and psychological aspects of B2B pricing? Central research questions are, in my view, all those instances where decisions about price violate basic principles of rational choice. Decisions about price involve two main actors. First is the customer. We are interested in how customer purchase decisions exhibit behavioral patterns that are inconsistent with rational choice models. As we will see, violations of rational choice can take many forms: demand that increases with price increases, choices that are influenced by the addition of irrelevant options, preferences that are unstable, and a willingness to pay that is fluid and subject to contextual influences. In this context we thus summarize how firms can influence customer perceptions of value and price without changing the price. Second is the manager. Managers set prices and in this process are equally susceptible to violating fundamental principles of rational choice. These violations can take the following forms: conformity bias, competition neglect, competitor obsession, simple heuristics, and underpricing for new product introductions.

This paper is organized as follows. The paper first provides an overview of the current research on behavioral and psychological aspects of pricing: since most of what we know in this respect stems from experimental research done with individual consumers, this paper sheds light on those areas where there is a strong need for quantitative studies with B2B customers and managers: We weave extant research into a parsimonious framework and highlight implications for industrial marketing theory and practice. We conclude by taking a stand on the way forward.

2. Behavioral and psychological aspects of pricing—what we know about violations of rational choice in decisions about prices

Rational choice models posit that actors behave in a way that maximizes their expected utility. Indicators are, for example, that preferences are transitive, invariant of alternative descriptions and independent of irrelevant alternatives (Fawcett et al., 2014; Tversky, & Kahneman, 1986). This view of rational choice posits that decision makers act consistently with regard to their preferences, regardless of the nature of these preferences. This view of rational choice is thus able to incorporate a wide range of commonly observed choice anomalies: The fact that customers, for example, do not regularly check prices before purchases—an apparent example of irrationality (Lester, 2011)—does not at all, to be clear, violate rationality: the costs of collecting and evaluating price information probably outweigh potential savings. Likewise: the fact that managerial pricing actions are shortsighted at times does not, in principle, indicate non-rational behavior: the short-term, more likely, gains of these activities (e.g., price cuts) outweigh the perceived long-term, less likely, costs. The current literature provides abundant evidence that decisions about prices—by customers as well as by managers—regularly violate principles of rational choice as defined here. We discuss this evidence in turn and provide an illustrated overview in Figs. 1 and 2.

2.1. The customer perspective: violations of rationality in decisions about purchase prices

Perceptions of value and price are not given: marketing managers can influence how customers perceive value and price and thus, to a

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Fig 1. Customers: violations of rational choice principles in decisions about purchase prices – a graphical overview.

degree, direct customer choice without actually changing the price. Based on the context, otherwise identical objects are perceived differently based on external cues, as Figs. 3 and 4 illustrate (see, for example, Coren, Girgus, Erlichman, & Hakstian, 1976).

More broadly, violations of basic principles of rational choice arise as a result of cognitive limitations—illustrated by the optical illusion –, as a result of incomplete information and as a result of limitations due to thinking styles which are less rational than the models imply.

2.1.1. The price–quality effect

Price and quality are only weakly correlated (Mitra & Golder, 2006); numerous studies in consumer markets, however, suggest a positive and significant relationship between price and customer perceived quality (Rao & Monroe, 1989; Völckner & Hofmann, 2007). Especially when customers cannot easily evaluate product quality, they rely on price as an indicator of quality (Brucks, Zeithaml, & Naylor, 2000). Higher prices signal higher quality. For some categories (e.g., higher price, durable products, luxury goods), a price increase leads to an increase in demand (Hwang, Ko, & Megehee, 2014; Knauth, 1949). High prices may have tangible outcomes: improved performance after consumption of an expensive versus discounted energy drink (Shiv, Carmon, & Ariely, 2005), lower pain for expensive versus discounted analgesics (Waber, Shiv, & Carmon, 2008), and increased brain activity related to pleasantness for expensive versus cheap wine (Plassmann, O'Doherty, Shiv, & Rangel, 2008). Whereas the price–quality effect is robust in consumer markets, studies in industrial markets report mixed results (Dodds, Avila, & Wahlers, 1993; Kumar & Grisaffe, 2004; Lambert, 1981; White & Cundiff, 1978).

2.1.2. Irrelevant attributes

If decision makers were rational, the addition of irrelevant product attributes would not influence choice. This is not the case. Carpenter, Glazer, and Nakamoto (1994) show that the addition of irrelevant—in other words, meaningless—product attributes increases the perceived attractiveness of the product. This effect persists even if customers know that the attribute is meaningless (Broniarczyk & Gershoff, 2003; Sun, 2010): adding an irrelevant attribute to a product and increasing the price, even dramatically, creates a meaningfully differentiated brand, if the true relevance of the differentiating attribute is not known to customers. If, by contrast, customers understand that the differentiating attribute has no value, the presence of a meaningless attribute combined with a high price creates meaningful differentiation, but not in combination with dramatically high prices (Carpenter et al., 1994). Irrelevant attributes acquire value if linked to a positive outcome. It appears that customers infer that the provision of information means that this information is actually relevant. This may explain why brands built on meaningless differentiation—such as Red Bull and the meaningless ingredient Taurin, or Shell V-Power and the irrelevant attribute of 100 octane fuel (Beukert, 2003)—are widespread in consumer markets, despite—or probably because of—substantial price premiums.

To the best of my knowledge, there are no comparable studies in industrial markets. It is beyond question that this is a very significant gap in the literature and would make for a fascinating study.

2.1.3. Framing

Decisions take place within a context. In prospect theory the context is represented by risk perceptions: decision problems are usually posed

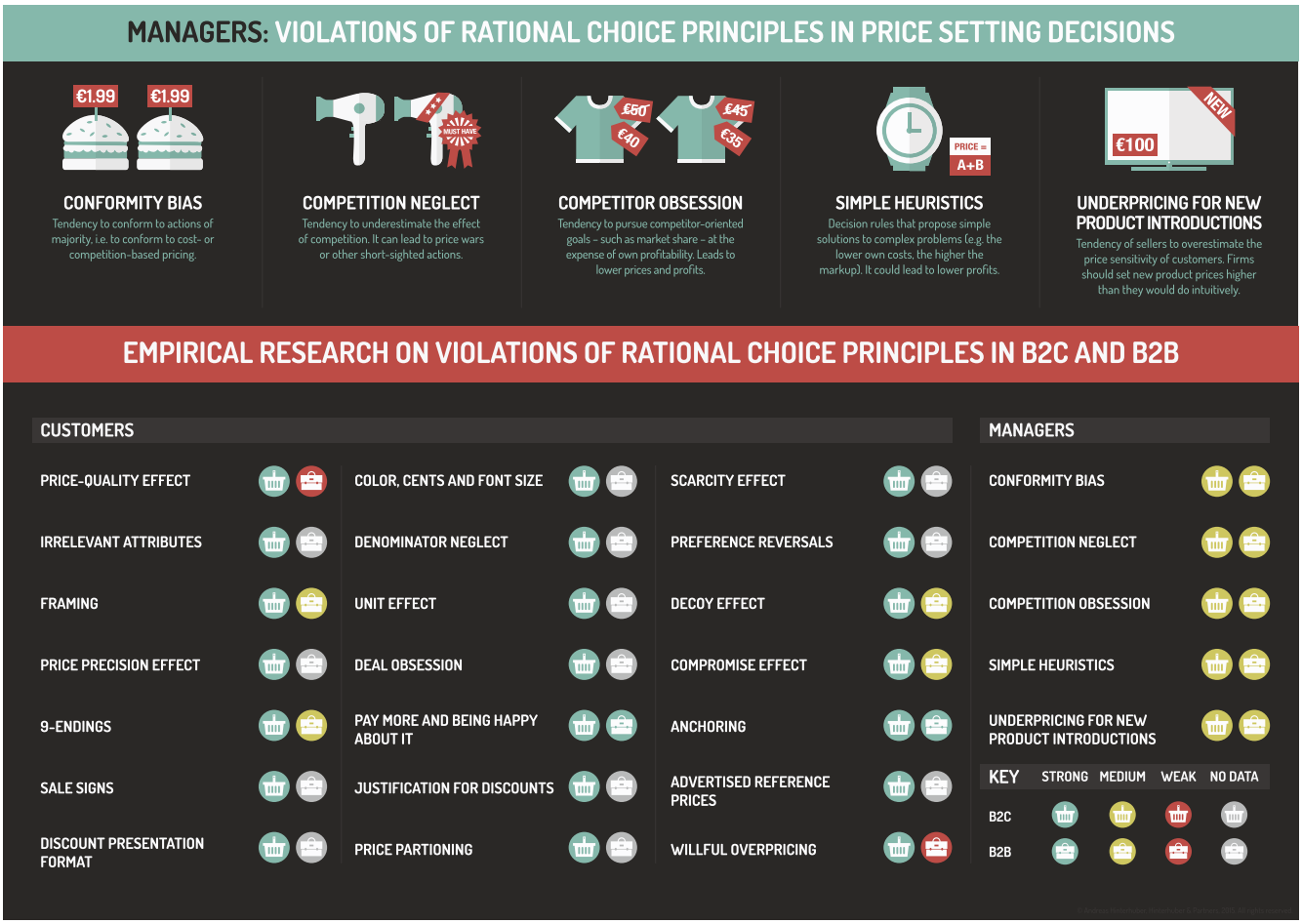

Fig. 2. Managers: violations of rational choice principles in price setting decisions – a graphical overview and an overall summary of empirical research.

as gambles, with two choices, a certain, lower-expected-value choice and a risky, higher-expected-value choice. A core tenet of prospect theory is that when decision makers view outcomes as a gain relative to the status quo, they become risk-averse. When the same outcomes are framed as a loss, decision makers become risk-seeking (Kahneman & Tversky, 1979). Framing outcomes as either a gain or a loss from the status quo thus changes behavior. Frequently, the status quo is represented by reference prices, that is, price expectations based on past prices. Recent research confirms the presence of reference price effects also in business markets, where loss-averse buyers adjust purchase quantities more strongly for price increases than for price reductions and where prices paid in previous periods have strong effects on reference prices in subsequent periods (Bruno, Che, & Dutta, 2012).

Likewise, the framing of discounts changes behavior: framing savings as a free bonus pack leads to higher sales than framing identical monetary savings as a percentage price reduction (Chen, Marmorstein, Tsiros, & Rao, 2012). The same principle applies also to the framing of price increases: the elasticity of package size is about one fourth that of price elasticity (Çakır & Balagtas, 2014). Presenting an otherwise identical price change as package-size reduction thus leads to a lower sales loss than a straight price increase.

Much of what we know about loss aversion and framing stems from research with consumers. Research with industrial marketing and purchasing managers is thus warranted.

2.1.4. The price–precision effect

On a stand-alone basis, precise prices are perceived to be smaller than round prices, since precise prices are quite common for smaller magnitudes (Thomas, Simon, & Kadiyali, 2010). In a study of transactional data of house prices Thomas et al. (2010) find that buyers underestimate the magnitude of precise prices, defined as prices with fewer than three ending zeros: precise list prices increase actual sales prices by 0.6%, even when the precise list price is above a comparable round price (e.g., $385,120 vs. 385,000). For big-ticket items, precise list prices increase customer willingness to pay. The effect of precise prices on

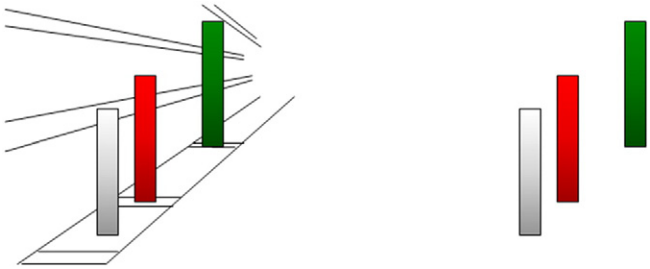

Fig. 3. Context influences perceptions.

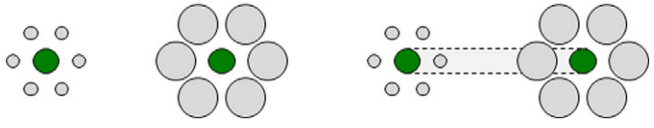

Fig. 4. Comparisons influence perceptions.

industrial customer willingness to pay is hitherto unexamined and needs to be studied.

2.1.5. 9-Endings

Research shows that customers consistently underestimate the prices of products ending in 9: this may be because customers process prices from left to right or because they erroneously assume that these prices refer to products on sale (Stiving & Winer, 1997). Studies show that increasing prices to a price ending in 9 frequently leads to an increase in sales (Anderson & Simester, 2003). Companies selling a product portfolio can thus steer customers towards targeted products, simply by manipulating prices ending in 9 (Manning & Sprott, 2009): the share of the lower-priced product is maximized if it has a 9-ending and the higher product has a round ending (e.g., $1.99 vs. $3.00). By contrast, the share of the higher-priced product is maximized, if price endings minimize the difference in the left-most digits ($2.00 vs. $2.99). Across studies, the effect of 9-endings on sales is robust in consumer markets (Gedenk & Sattler, 1999; Schindler & Kibarian, 1996; Stiving, 2000). In a recent conjoint study among industrial purchasing managers, the largest spike in demand for telecommunication services occurs at prices ending in 0, but prices ending in 9 also show a significant spike in demand over other prices (Larson, Reicher, & Johnsen, 2014). The effect of 9-endings on sales may thus be significant also in industrial markets, and quite possibly for lower-priced products.

2.1.6. Sale signs

The mere presence of a sign stating "Sale" increases demand (Anderson & Simester, 1998). Customer price knowledge is low (Dickson & Sawyer, 1990). Companies can thus increase sales without actually lowering prices, simply by adding a sale sign. There is an upper limit: category sales are maximized if approximately 25% of products have sale signs (Anderson & Simester, 2001).

2.1.7. Discount presentation format

How discounts are presented—percentage off versus absolute monetary savings—has an impact on price perceptions and purchase intentions. Recent studies confirm earlier research (Heath, Chatterjee, & France, 1995): for low-price products, the framing of discounts as percentage figures increases the perceived attractiveness of the offer, whereas for high-price products the opposite is true: absolute discounts are indicated for high-price products (McKechnie, Devlin, Ennew, & Smith, 2012). Thus: If percentage savings are high, they should be displayed; if absolute savings are high, they should be highlighted. Furthermore, value perceptions and purchase intentions are generally higher if the sales price is presented to the right of the original price (e.g., was $200, now $149) as opposed to presenting the sales prices first and then the original selling price (Biswas, Bhowmick, Guha, & Grewal, 2013).

2.1.8. Color, cents, and font size

Male participants perceive prices in red type as more attractive than prices in black type; by contrast, there is no effect of price color on females (Puccinelli, Chandrashekaran, Grewal, & Suri, 2013). Furthermore, across subjects, for large prices (i.e., above $1000), eliminating cents reduces the perceived magnitude of prices—consumers seem to assume a relationship between syllabic length and numerical magnitude (Coulter, Choi, & Monroe, 2012). Finally, font size matters (Coulter & Coulter, 2005): presenting the lower sale price in a smaller type results in higher purchase likelihood and lower price perceptions than presenting the sale price in large font size—as many retailers typically do. Since all these studies originate from experiments with consumers, we do require studies that examine the effect of color, cents, and type size in industrial markets.

2.1.9. Denominator neglect

For some product categories in industrial markets, failure rates are important purchase criteria (Wu, Hou, Fu, & Chang, 2013). Kahneman (2011, p. 329) uses the expression "denominator neglect" to suggest that low-probability events—such as failure rates—weigh more heavily in the mind of decision makers when expressed in absolute terms (e.g., 5 failures per 1000 h of operation) than when expressed in terms of probabilities (e.g., failure rate of 0.5%). When presented with uncertain outcomes, decision makers seem to neglect the denominator, that is, the absolute number of outcomes, focusing instead excessively on the numerator. Also here, further research with industrial customers appears promising.

2.1.10. Unit effect

Attribute differences appear larger on scales with higher numbers of units (Pandelaere, Briers, & Lembregts, 2011). Expressing product attributes on scales with higher unit values—for example, expressing a guarantee as 84 months as opposed to 7 years—leads customers to perceive these attributes as larger than if expressed on a scale with lower unit values. This influences not only customer preferences but also willingness to pay. It would be interesting to understand whether the unit effect is present also in industrial markets.

2.1.11. Deal obsession

The remote possibility of obtaining something for free clouds customer judgment. Research on the widespread diffusion of conditional—that is, uncertain and delayed—promotions indicates that customers overestimate the probability of actually getting something for free (Ailawadi, Gedenk, Langer, Ma, & Neslin, 2014). Customers, in other words, are deal obsessed, and the unlikely possibility of a obtaining a high win reduces search incentives and increases willingness to pay.

2.1.12. Paying more and being happy about it

In a survey among customers of Internet service providers, Lambrecht and Skiera (2006) find that 28% of customers on a flat-fee plan would have been better off under a pay-per-use plan. This flat-fee bias is driven by displeasure associated with metering (taxi-meter effect), by the desire to insure against variation in the monthly billing rate (insurance effect), and by overestimation of actual usage (overestimation effect). In a study of business customers of mobile phone services, Stingel (2008) finds that the flat-rate bias affects 73% of all tariff choices, driven mostly by the overestimation effect and the insurance effect (Backhaus, Koch, & Stingel, 2011). The flat-fee bias is thus more prevalent in industrial than in consumer markets, and supplier profits are threatened much more if business customers on a flat fee select the least expensive plan (i.e., pay-per-use) than if individual consumers do likewise. Taken together, these studies thus suggest that the principles of rational decision making are not necessarily more widespread in B2B than in B2C settings.

The effect of paying more and being happy about it is observable also in the context of conditional discounts: customers who qualify for the minimum purchase requirement (e.g., US $500) and are offered a lower discount (e.g., 20%) end up being more satisfied than customers who are offered a larger discount (e.g., 30%) without the minimum purchase requirement (Yoon & Vargas, 2010). This B2C study would suggest that companies can increase perceived customer satisfaction not by increasing discounts but, on the contrary, by reducing discounts and making these discounts contingent on a minimum purchase requirement. Also here we need a study in B2B.

2.1.13. Justification for discounts

A rational actor should not care about the reasons for a price reduction, as long as the price itself meets predefined criteria. Research, however, suggests that customers care about motivations for discounts and that plausible motivations (e.g., cost reductions as opposed to more selfish motives such as stock clearance) positively enhance price

perceptions (Bobinski, Cox, & Cox, 1996). Similarly, experimental research suggests that repurchase intentions after price increases depend on the perceived fairness of the motivation for the price increase (Homburg, Hoyer, & Koschate, 2005). This study apparently confirms the notion that fairness matters in pricing (Thaler, 1985): Fairness in pricing, however, is a very tricky terrain, because "it is difficult to articulate what is fair" (Xia, Monroe, & Cox, 2004, p. 1). Like beauty, fairness is largely in the eyes of the beholder. For industrial marketing theory we thus need, first and foremost, a robust construct of price fairness before linking price fairness with demand, as research in consumer markets attempts to do (Anderson & Simester, 2008).

2.1.14. Price partitioning

Sellers in industrial markets have the option of offering an all-inclusive price or of separating out the individual price components. Price partitioning highlights secondary attributes customers may otherwise overlook (Bertini & Wathieu, 2008). Companies are thus well advised to partition prices so that prices for low-perceived-benefit components are low and vice versa (Hamilton & Srivastava, 2008). Numerous studies indicate that price partitioning leads customers to underestimate the total price (Lee & Han, 2002) and increases price perceptions and purchase intentions (Xia & Monroe, 2004). Customers seem to insufficiently adjust from the initial price of the focal product. For products or customers where the price–quality effect is present, price partitioning may be especially beneficial (Völckner, Rühle, & Spann, 2012). Also here, studies in industrial markets are required.

2.1.15. Scarcity effect

The perception of scarcity increases willingness to pay and purchase quantities. Customers will purchase substantially larger quantities if the offer is limited—by product quantity, purchase time, or location. In a study on a price promotion for a fast-moving consumer good, purchase quantities per person more than double when the promotion is accompanied by a purchase limit—"limit of 12 per person"—compared to the no-limit condition (Wansink, Kent, & Hoch, 1998). In a more recent study of scarcity effects in the U.S. automotive industry, Balachander, Liu, and Stock (2009) find that a 1% increase in scarcity—measured as inventory during introduction relative to industry average—increases car sales by 0.5% even after accounting for sales lost due to greater scarcity. Artificially restraining demand thus increases demand. Studies in industrial markets seem beneficial.

2.1.16. Preference reversal

Beginning with the work of Slovic and Lichtenstein (1968), numerous studies find that similar methods of preference elicitation lead to substantially different preference orderings. Also here, these results violate basic principles of rationality. The effect of preference reversals is best illustrated by comparing preferences in joint—that is, comparative—versus separate—that is, stand-alone—evaluation methods. Numerous studies by Hsee (1998) suggest that the low-value option is more highly valued than the high-value option in the single evaluation method, but not in joint evaluation. "Less is better" is the term coined by Hsee (1998) for this instance of preference reversals. An illustration: in joint evaluation, a used dictionary with a small cosmetic defect is valued more than a dictionary with fewer entries but in like-new condition. In separate evaluations, the reverse is true. Hsee explains these preference reversals with the "evaluability hypothesis" (Hsee & Leclerc, 1998): attributes that are difficult to evaluate independently (e.g., number of entries in a dictionary) loom larger in joint evaluations, whereas attributes that are easy to evaluate independently (e.g., cosmetic condition) loom larger in single evaluations. Thus: If a product scores low on an attribute that is difficult to evaluate, separate evaluation increases willingness to pay. A final example: in joint evaluation, willingness to pay for 8 oz of ice cream in a 10-ounce cup is larger than the willingness to pay for 7 oz of ice cream in a 5-ounce cup—so far, so good. In separate evaluation, the reverse is true: simply by modifying the context (i.e., cup size), the willingness to pay for the small product is higher than the willingness to pay for the large product (Hsee, 1998). We know next to nothing about preference reversals in industrial markets.

2.1.17. Decoy effect

Consider the following experiment: a company is selling a product in two formats: the small size costs $4, the large size $8. Let the majority of customers purchase the small size. Assume the company introduces a medium size at a price of $7.50. The share of customers purchasing the large size is expected to increase substantially. Formally: The introduction of an irrelevant ("decoy") option provides a strong justification for the choice of an initially unappealing option if this option is close to the decoy option (Huber, Payne, & Puto, 1982). In consumer-goods markets the use of decoy options is widespread (Hinterhuber & Liozu, 2014). The decoy effect is heavily dependent on thinking styles: it is completely absent for consumers scoring low on intuitive thinking, and it is very strong for consumers relying heavily on intuitive thinking (Mao & Oppewal, 2012). There are indications that industrial goods manufacturers are starting to include decoy options in their product portfolio (Kivetz, Netzer, & Srinivasan, 2004). We do not have, to date, empirical research on the effect of decoy options on sales in industrial markets.

2.1.18. Compromise effect

When faced with a range of non-dominant options that vary along price and quality, consumers tend to opt for the intermediate option (Simonson, 1989). Also, this effect is a clear and well-researched violation of rational choice: an option gains share when it is the intermediate option in an arbitrarily arranged choice set, whereas it loses share when it becomes an extreme option. Except where options involve a non-compensatory assortment (Gourville & Soman, 2007), the compromise effect is widespread. Simonson (1989) reports an average share gain of 17.5% when an option becomes the intermediate option. Customers exhibit choice patterns consistent with the compromise effect also in the context of industrial purchasing situations (Kivetz et al., 2004).

2.1.19. Anchoring

In stark contrast to rational behavior, Ariely, Loewenstein, and Prelec (2003) find that willingness to pay is strongly influenced by arbitrary anchors: in a series of experiments students indicate whether they are interested in buying a set of objects at a price greater than the last two digits of their social security numbers; thereafter, they indicate their maximum willingness to pay. Strikingly, the maximum willingness to pay between the top-quintile and bottom-quintile subjects differs by a factor of three, depending entirely on a randomly supplied anchor. A core tenet of research in anchoring is thus: externally supplied anchors, such as prices, influence internal standards of comparison that are used in subsequent price judgments. In an analysis of 1474 pieces of auction data for classic cars, Nunes and Boatwright (2004) find that the price for a winning bid is strongly influenced by the price for the immediately preceding car. In numbers, if the preceding car sells at two times its Blue Book value, the high bid for the immediately subsequent car is 30% higher on average: willingness to pay is influenced by totally unrelated sales prices. Experimental data corroborate these findings (Adaval & Wyer, 2011; Koçaş & Dogerlioglu-Demir, 2014). The powerful effect of anchors is visible in negotiations (Ritov, 1996), in catalogue retailing (Krishna, Wagner, Yoon, & Adaval, 2006), in investment decisions (Shapira & Shaver, 2014), in contingent valuations (Green, Jacowitz, Kahneman, & McFadden, 1998), and even in settlements in lawsuits (Poundstone, 2010). Anchors exert a powerful influence also in B2B negotiations: a recent study suggests that settlement prices in negotiations between buyers and sellers in the chemical industry are strongly influenced by the seller's aspiration price and the seller's initial price

offering (Moosmayer, Schuppar, & Siems, 2012): the more sellers in industrial markets ask for, the more they get.

2.1.20. Advertised reference prices

Advertised reference prices (ARPs) highlight the difference between a sales price and a regular list price. Ample research, albeit limited to consumer markets, suggests that ARPs raise internal reference prices of customers, favorably influence the perceived attractiveness of the offer, and increase purchase likelihood (Lichtenstein, 2005). ARPs are widespread and frequently exaggerated. A fascinating finding, consistent throughout the studies, is that customers are influenced by implausible ARPs, even when they themselves understand that these ARPs are inflated. Customers know that these ARPs cannot possibly be true, yet implausible ARPs still influence customer behavior, that is, purchase intentions (Suter & Burton, 1996; Urbany, Bearden, & Weilbaker, 1988). Exaggerated ARPs are even more effective when the offer induces a feeling of time pressure (Krishnan, Dutta, & Jha, 2013).

2.1.21. Willful overpricing

A price may induce customers to think about whether they need a benefit or not: setting prices moderately higher than what consumers expect to pay leads to deeper engagement with product and sales to a smaller, polarized, committed pool of consumers (Wathieu & Bertini, 2007). Recent studies in fact suggest that willingness to pay is not a stable amount but a fluid concept that can be shaped by marketing actions (Ariely, Loewenstein, & Prelec, 2006; Hinterhuber, 2014; Park, MacLachlan, & Love, 2011). Anecdotal evidence indicates that not only consumer-goods companies (e.g., Apple, Louis Vuitton, Starbucks) but also industrial manufacturers (e.g., HP, Maersk, Monsanto, Sandvik, SAP, SKF) set prices moderately higher than the initial willingness to pay with the specific intent of increasing willingness to pay.

Table 1 summarizes the customer perspective: violations of rational choice principles in decisions about purchase prices.

2.2. The firm perspective: violations of rationality in the process of price setting

Managers as price setters likewise commit violations of basic principles of rational choice. I briefly present salient studies below.

2.2.1. Conformity bias

This refers to the tendency to conform to the actions and opinions of the majority. In a now classic study, Asch (1955) examines whether individuals accept the clearly aberrant opinions of opponents. The error rate, that is, the tendency to accept a wrong opinion, rises substantially with the number of opponents: with only one opponent, the error rate is 3.6%, with three opponents the error rate jumps nearly tenfold, to 32%. A confidently expressed and aberrant opinion, if widely held, is able to induce a behavioral change in decision makers. Conformity bias can thus explain why the vast majority of companies practices cost- or competition-based pricing even though value-based pricing is recognized as a superior approach to pricing (Hinterhuber & Liozu, 2012; Liozu & Hinterhuber, 2013b).

2.2.2. Competition neglect

Overconfidence leads managers to neglect competition (Camerer & Lovallo, 1999). It induces managers to take on large risks based on the assumption that they can beat the odds (Camerer & Lovallo, 1999). Overconfidence may thus explain why executives engage in frontal attacks, start price wars, or select a crowded competitive arena without sufficiently anticipating the effect of a competitive response. In a study of selling prices on eBay, Simonsohn (2010) finds that 40% of auctions end during peak selling times, leading to both lower prices and lower sales probabilities as a result of excess supply. The author notes that this concentration is driven primarily by professional sellers. Sellers seem to systematically neglect competition. Critically, overconfidence depends on managerial abilities: more experienced, better educated managers tend to enter markets with fewer competitors, which leads to higher survival rates and higher revenues of their companies (Goldfarb & Xiao, 2011).

2.2.3. Competitor obsession

This refers to the tendency to pursue competitor-oriented goals—such as market share—to the detriment of one's own profitability (Arnett & Hunt, 2002). When comparative profits are provided, managers show a consistent tendency to price below optimal levels in order to hurt competition, as opposed to maximizing their own profits (Armstrong & Collopy, 1996). Field studies suggest that competitor orientation and market share goals are detrimental to profitability (Armstrong & Collopy, 1996; Foreman, Donthu, Henson, & Poddar, 2014). Anterasian, Graham, and Money (1996, p. 74) warn explicitly: "The use of market share as a measure of corporate or executive performance is at best a waste of time; at worst, it is totally misleading. We recommend that you never make the market share calculation. If you emphasize competitive goals, you are letting the competition define your business and its success." Competitor obsession leads to lower prices and lower profits. This effect is well documented in industrial markets (Armstrong & Collopy, 1996).

2.2.4. Simple heuristics

Heuristics are tools built to find simple solutions to complex problems (Mousavi & Gigerenzer, 2014). In pricing, these heuristics can take the following forms (Hinterhuber, 2004; Hinterhuber & Liozu, 2012; Liozu & Hinterhuber, 2013a; Nagle & Holden, 2002): "The lower the cost, the higher the markup," "Price slightly below the market share leader," or "For differentiated products, set the price at a moderate premium." Since these heuristics relate to costs and competitors, extant research (Liozu & Hinterhuber, 2013b) would suggest that they are associated with lower profitability. In fact, we do not know. For simple tasks, complex models outperform simple heuristics on explanatory power, but simple heuristics outperform the models on predictive power (Czerlinski, Gigerenzer, & Goldstein, 1999). For complex tasks—such as decisions by large retailers on whether or not to classify customers as inactive—simple heuristics perform at least as well as complex models (Wübben & Wangenheim, 2008).

Since heuristics are so widespread, an examination of performance implications of pricing heuristics would make for a fascinating study.

2.2.5. Underpricing for new product introductions

The widely held assumption that managers tend to underprice new products (Hinterhuber, 2004; Marn, Roegner, & Zawada, 2004) is supported by recent findings from behavioral economics: Shen, Hsee, Wu, and Tsai (2012) suggest that sellers, engaging in joint evaluation modes when considering alternative prices, overestimate the price sensitivity of customers, who, in single evaluation mode, see only the final set price. The authors suggest that firms should set new product prices higher than they would do intuitively, especially for those products where price information is not readily available to buyers.

Table 2 summarizes the manager perspective: violations of rational choice principles in price setting decisions.

On customer biases about pricing decisions: we cannot conclude that behavioral biases are consistently more pronounced in B2C than in B2B. The price–quality effect is, for one, strong in B2C and receives only mixed support in B2B. Reference prices, 9-endings, and anchoring are well-documented biases both in B2B and in B2C. For other effects that are well documented in consumer markets—decoy options, compromise effect, willful overpricing—there is at least anecdotal evidence in B2B. The tariff-choice bias, finally, is stronger in B2B than in B2C.

Table 1
Customers—violations of rational choice principles in decisions about purchase prices.

Effect	Implication	Representative literature	Dependent variable	B2B
Price–quality effect	High price signals high quality. For differentiated products, an increase in price may thus lead to an increase in volume.	Rao and Monroe (1989)	Purchase intentions, purchase behavior	Mixed evidence (Dodds et al., 1993; Kumar & Grisaffe, 2004; Lambert, 1981; White & Cundiff, 1978)
Irrelevant attributes	Adding an irrelevant attribute and increasing the price creates a meaningfully differentiated brand.	Carpenter et al. (1994)	Purchase intentions, purchase behavior	–
Framing	Customers react differently based on how offers are framed. Framing influences purchase decisions, e.g., framing identical savings as a free bonus leads to greater sales than framing these as a discount.	Kahneman and Tversky (1979), Chen et al. (2012)	Purchase intentions, purchase behavior	Reference price effects are powerful also in industrial markets (Bruno et al., 2012)
Price–precision effect	Precise prices are perceived to be smaller than round prices. Increasing prices to a precise number increases purchase likelihood.	Thomas et al. (2010)	Purchase intentions, purchase behavior	–
9-Endings	Prices ending in 9 increase sales volume.	Anderson and Simester (2003)	Purchase intentions, purchase behavior	Effect of prices ending in 0 is larger than effect of prices ending in 9 (Larson et al., 2014)
Sale signs	Merely adding a "sale" sign to a product increases product sales.	Anderson and Simester (2001)	Purchase intentions, purchase behavior	–
Discount presentation format	For low-price products, percentage discounts, for high-price products, absolute discounts, increase purchase intentions.	McKechnie et al. (2012)	Purchase intentions	–
Color, cents, and type size	Male subjects perceive prices in red as more attractive than prices in black. Eliminating cents increases the perceived attractiveness of large selling prices. Presenting the lower sale price in small type increases purchase likelihood.	Puccinelli et al. (2013), Coulter et al. (2012), Coulter and Coulter (2005)	Perceptions of price magnitude; purchase intentions	–
Denominator neglect	Customers underestimate likelihoods when probabilistic events are expressed in percentage terms rather than in absolute terms.	Kahneman (2011)	Perceptions of likelihood	–
Unit effect	Customers treat product attributes as dimensionless quantities: attributes expressed on a scale with higher numbers of units appear larger.	Pandelaere et al. (2011)	Purchase intentions and willingness to pay	–
Deal obsession	Customers will purchase substantially larger quantities and/or pay substantially higher prices than anticipated just to experience the benefits of having obtained a deal.	Ailawadi et al. (2014)	Purchase intentions, purchase behavior	–
Paying more and being happy about it	Flat-fee bias: Customers derive more pleasure from high, but predictable fees than from lower, but fluctuating fees. Conditional discounts: customer satisfaction is higher for lower, but conditional discounts than for higher, unconditional discounts.	Lambrecht and Skiera (2006), Yoon and Vargas (2010)	Purchase behavior, perceptions of satisfaction	Flat-rate bias is stronger in B2B than in B2C (Stingel, 2008)
Justifications for discounts	Perceptual responses to discounts depend on rationale that retailers provide: plausible discount explanations increase perceived attractiveness.	Bobinski et al. (1996)	Purchase intentions	–
Price partitioning	Customers underestimate partitioned prices: price partitioning leads to more favorable price perceptions and increased purchase intentions.	Xia and Monroe (2004)	Purchase intentions	–
Scarcity effect	Customers will purchase substantially larger quantities and/or pay substantially higher prices than anticipated if the offer is limited—by product quantity, purchase time, or location.	Balachander et al. (2009)	Purchase behavior	–
Preference reversals	The ability of customers to evaluate product attributes influences willingness to pay. Presenting products separately versus conjointly reverses preferences.	Hsee (1998)	Purchase intentions, purchase behavior	–
Decoy effect	The introduction of an irrelevant option provides a strong justification for the choice of an initially unappealing option.	Kivetz et al. (2004)	Purchase intentions, purchase behavior	Anecdotal evidence (Kivetz et al., 2004)
Compromise effect	When faced with a range of non-dominant options that vary along price and quality, consumers tend to opt for the intermediate option. Intermediate options are preferred to extreme options.	Simonson (1989), Kivetz et al. (2004)	Purchase intentions, purchase behavior	Anecdotal evidence (Kivetz et al., 2004)
Anchoring	Prices of totally unrelated products increase willingness to pay and prices actually paid.	Nunes and Boatwright (2004)	Purchase intentions, purchase behavior	Present in B2B: Moosmayer et al. (2012)
Advertised reference prices (ARPs)	ARPs influence customer behavior, even when customers know these ARPs to be untrue.	Lichtenstein (2005)	Purchase intentions, purchase behavior	–
Willful overpricing	Setting prices moderately higher than what consumers expect to pay increases willingness to pay.	Park et al. (2011), Wathieu and Bertini (2007)	Purchase intentions, purchase behavior	Anecdotal evidence: Bertini and Wathieu (2010)

Table 2
Managers—violations of rational choice principles in price setting decisions.

Effect	Implication	Representative literature	Dependent variable	B2B
Conformity bias	Tendency to conform to actions of majority, i.e., to conform to cost- or competition-based pricing.	Asch (1955)	Pricing decisions	Some evidence in B2B: Hinterhuber and Liozu (2012); Liozu and Hinterhuber (2013b)
Competition neglect	Tendency to underestimate effect of competition.	Simonsohn (2010)	Pricing decisions	Robust evidence: Goldfarb and Xiao (2011)
Competitor obsession	Tendency to pursue competitor-oriented goals—such as market share—to the detriment of one's own profitability. Leads to lower than optimal prices and profitability.	Armstrong and Collopy (1996)	Pricing decisions	Robust evidence also in B2B: Armstrong and Collopy (1996)
Simple heuristics	Decision rules that propose simple solutions to complex problems: e.g., the lower own costs, the higher the markup.	Mousavi and Gigerenzer (2014)	Pricing decisions	–
Underpricing for new product introductions	Tendency of sellers to overestimate the price sensitivity of customers.	Shen et al. (2012)	Pricing decisions	Anecdotal evidence: (Marn et al., 2004)

On managerial biases about pricing decisions: evidence for the biases we identify—conformity bias, competition, neglect, competitor obsession, simple heuristics, and underpricing for new product introductions—originates to a near equal degree from both B2C and B2B data.

3. Outlook

Customer biases in purchase decisions about price and managerial biases in price setting do not seem to make sense if viewed in light of rational decision making. This, in fact, may be the mistake. The assumption of rational decision making is the equivalent of defending the shopkeeper's position in Monty Python's most famous sketch (Montier, 2009). The sketch is about the incompatible positions of an annoyed customer and the shopkeeper regarding the vital state of a parrot (Monty Python's Flying Circus, 1969):

Customer: I wish to complain about this parrot what I purchased not half an hour ago from this very boutique.
Owner: Oh yes, the, uh, the Norwegian Blue … What's, uh … What's wrong with it?
Customer: I'll tell you what's wrong with it, my lad. 'E's dead, that's what's wrong with it!
Owner: No, no, … he's resting.
Customer: Look, matey, I know a dead parrot when I see one, and I'm looking at one right now.
Owner: No no, he's not dead, he's, he's resting! Remarkable bird, the Norwegian Blue. … Beautiful plumage!
Customer: The plumage don't enter into it. It's stone dead.
Owner: Nononono, no, no! 'E's resting! ….
Owner: The Norwegian Blue prefers keeping on its back! Remarkable bird, isn't it, squire? Lovely plumage!
Customer: Look, I took the liberty of examining that parrot when I got it home, and I discovered the only reason that it had been sitting on its perch in the first place was that it had been nailed there.
Owner: Well, of course it was nailed there! If I hadn't nailed that bird down, it would have nuzzled up to those bars, bent them apart with its beak, and Voom! Feeweeweewee!
Customer: "Voom"?!? Mate, this bird wouldn't "voom" if you put four million volts through it! 'E's bleeding demised!
Owner: No no! 'E's pining!
Customer: 'E's not pinin'! 'E's passed on! This parrot is no more! He has ceased to be! He's expired and gone to meet his maker! He's a stiff! Bereft of life, he rests in peace! If you hadn't nailed him to the perch he'd be pushing up the daisies! 'Is metabolic processes are now history! 'E's off the twig! 'E's kicked the bucket, he's shuffled off his mortal coil, run down the curtain and joined the bleedin' choir invisible!! This is an ex-parrot!
Owner: Well, I'd better replace it, then. Sorry squire, I've had a look 'round the back of the shop, and uh, we're right out of parrots.
Customer: I see. I see, I get the picture.
Owner: I got a slug.
Customer: Pray, does it talk?
Owner: Nnnnot really.
Customer: Well it's hardly a bloody replacement, is it?!

No matter how often the increasingly annoyed customer points out that the parrot is dead, the shop owner stubbornly replies that the parrot is resting. The shopkeeper is akin to mainstream economic models postulating rationality. Rationality is not merely resting, it may never have existed in the first place. The parrot is not resting, the parrot is dead. We need a replacement.

What form could this replacement take? I dare to offer a few suggestions. We will need an understanding of the neuroscientific foundations of human brain activity. Current research uses functional magnetic resonance imaging to understand the neural basis of human decision processes, also in the context of marketing and pricing research (Camerer, Loewenstein, & Prelec, 2005; Karmarkar, 2011; Knutson, Rick, Wimmer, Prelec, & Loewenstein, 2007; Somervuori & Ravaja, 2013). This research questions, to a degree, the role of the cerebral cortex in shaping decisions. Since the Enlightenment the cerebral cortex, the most highly developed part of the human brain responsible for complex functions such as language and information processing, has been seen as the center of decision making. This view is challenged by recent advances in neuroscience: "There is no one boss in the brain" (Gazzaniga, 2011, p. 44). Research in neuroscience indicates that emotional brain circuits are heavily involved in all stages of decision making, that is, preference formation, selection and execution of actions, and experience or evaluation of an outcome (Ernst & Paulus, 2005). In a widely cited experiment, researchers record increased brain activity related to the resultant action several hundred milliseconds before subjects report the first awareness of a conscious will to act (Libet, 1985). Conscious will follows previous brain activity. An analogy will clarify. Imagine a man on an elephant. The elephant is the brain, the man is the cerebral cortex. There may be circumstances when the man is able to command the elephant—this could be in an aseptic environment akin to university test labs. In most other circumstances, the man may whip the stick—the

elephant, of course, is most unimpressed and proceeds on own terms. So far, the models have looked at the man to understand how the system—man and elephant—works. It is now time to look at the elephant. This special issue constitutes an important step.

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