Information Behavior in B2B Pricing
Conceptual Development and Assessment of Managerial Strategies in B2B Price-Relevant Information Management

D I S S E R T A T I O N
of the University of St.Gallen
School of Management,
Economics, Law, Social Sciences,
International Affairs and Computer Science,
to obtain the title of
Doctor of Philosophy in Management

submitted by

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Dissertation no. 5249

Difo-Druck GmbH, Untersiemau 2022

The University of St.Gallen, School of Management, Economics, Law, Social Sciences, International Affairs and Computer Science, hereby consents to the printing of the present dissertation, without hereby expressing any opinion on the views herein expressed.

St.Gallen, May 24, 2022

The President:

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„Getting detailed, accurate, and timely answers […] is a multi-departmental effort. A single pricing department or group could not do it alone. It involves the cooperation and interaction of sales, marketing, finance, accounting, marketing research, forecasting, and others in order for a complete understanding of the important issues before any pricing decision can be made.“

(Lancioni, 2005, p. 178)

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Acknowledgements

First of all, I would like to thank Prof. Dr. Sven Reinecke for giving me the opportunity to work and research at the intersection of practical and theoretical relevancy. Sven taught me, among other things, how to successfully translate research results into actionable practical recommendations. Thank you, Sven, for your support and encouragement, especially in my publication projects.

Furthermore, I would like to thank Prof. Dr. Andreas Herrmann for his feedback on my dissertation projects and his helpful advice regarding the research directions worth pursuing.

Besides my academic advisors, I would like to thank the people who constantly kept track of my progress and often discussed and even more often challenged my projects and ideas. This addresses a range of scholars, fellow doctoral students, as well as much appreciated (pricing) managers from industry. The constant mirror of rigor and relevancy you hold up for me lets me be aware of whose practical problems I am addressing and which research results I am building upon.

Daniel Weltin, I would like to thank you for the two years in the HSG Mentoring Program – for sharing your thoughts and your strategic perspective. I always appreciate your honest and direct feedback and your support. I am thankful for the insights you share with me.

At the university my days would never have been as much fun without Felix, Martin B., Martin S., Mauro, Max, and Severin. Thank you for every storytelling session, every dis(s)cussion and the caffeine we shared. I hope we will continue to spend time together even when we do not share an office anymore.

I would like to thank the "WG Engelgasse" for a second home during the pandemic, for your extraordinary delicious food, and for endless attempts to save the world (be it in games, in thoughts or in food waste prevention).

Jana, it would be an underestimation if I thanked you only for the multitude of encouraging, reflective, and compassionate voice messages. It is the hardest part to put everything into words that we shared over the last ten years. What started with a strange birthday party and a very weirdly named cocktail has developed into a friendship that survives despite distance, time differences, or everyday distractions. Without you, my days would have been much more lonely and the writing phase of this dissertation a lot less fun.

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Annette and Meike, I would like to thank you for giving me a place where I can zoom out from work and research. You regularly provided distraction and you believe with me in the adventures behind every game board.

Mauro, thank you for being there with me and for me – all the way. I have no words that adequately express the way you support my projects, believe in my ideas, and accept the way either one turns out. I am very grateful, that you share your research perspectives with me and discuss the wildest hypotheses.

Thank you, Bea and Marco, for making me feel welcome in your home and for the promise that there are beautiful mountains behind all clouds and fog.

Thank you, Alex, for endless journeys through Andor, for your willingness to share your last supplies with me, and for the guarantee that you'll always fight by my side. In 23 years, there are a lot of things that I am grateful for. Yet, the most recent ones include baking about a hundred yeast pastries in one day, a wooden telephone sideboard, and a midnight call in March – I hope you know what your exceptional perspective means to me!

Mama and Papa, thank you for constantly reminding me that I am always free to take my own decisions and that it is important to enjoy life while it happens. Thank you for giving me a home, no matter where I am, and for helping me build my own home in St. Gallen.

Lastly, even though you will never read these lines, my deepest gratitude goes to you, Oma! You were there the moment I decided to start at HSG – and you were there every single day since. I thank you for all the elegantly put poetic wisdom that your voice still whispers into my ears. I wish you could be here for this, as you have been for all the events in my life.

Thank you all – your time and company are priceless to me.

Thursday, 30.06.2022 Iris-Katharina Schmutz

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Abstract

This thesis investigates the information behavior of pricing managers during the price-setting process. Price-relevant information deficits are a frequently encountered problem in pricing practice and often stand in the way of normative or planned pricing processes. This thesis conceptualizes and assesses the reactions of pricing managers confronted with an information deficit. It connects information-seeking processes and strategic management knowledge with the realm of pricing. The studies discuss the problem of information maximization and, based on this discussion, propose stopping rules for price analysis. Furthermore, four relevant types of heuristics in price analysis are identified and their relationships to pricing capabilities as well as firm performance are established. It is found that pricing managers can successfully bridge price-relevant information deficits by applying causal as well as effectual heuristics in price setting. Therefore, established normative pricing models are supplemented by the dimension of effectuation theory which supports the understanding of real-world pricing practices under severe uncertainty and pressure. In addition to contributing to a better understanding of B2B pricing practices, the models proposed in this monograph provide some orientation on information behavior in pricing and build the ground for further investigations of price management decisions. Moreover, the results of this thesis provide valuable insights for companies asking themselves whether investments in pricing will pay off, and if so, where and when to invest. Since pricing managers are the research subjects of this thesis, the results provide actionable recommendations regarding their potential for professionalization.

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Zusammenfassung

Die vorliegende Dissertation untersucht das Informationsverhalten von Pricing-Manager:innen während des Preissetzungsprozesses. Preisrelevante Informationsdefizite sind ein häufig auftretendes Problem in der Preisbildungspraxis und stehen normativen oder geplanten Preisbildungsprozessen oft im Wege. Diese Arbeit konzeptualisiert die Reaktionen von Pricing-Manager:innen, die mit einem Informationsdefizit konfrontiert sind, und untersucht diese empirisch. Die Studien und ihre Ergebnisse verknüpfen Forschungserkenntnisse aus dem Informationsverhalten und dem strategischen Management mit dem Bereich der aktiven Preisgestaltung. Die Studien diskutieren ausserdem das Problem der Informationsmaximierung und schlagen darauf aufbauend sog. „stopping rules“ für die Preisanalyse vor. Darüber hinaus werden vier relevante Arten von Heuristiken in der Preisanalyse identifiziert und ihre Beziehungen zu den Preisgestaltungsfähigkeiten sowie zum Unternehmenserfolg untersucht. Es zeigt sich, dass Pricing-Manager:innen preisrelevante Informationsdefizite erfolgreich überbrücken können, indem sie sowohl „causal“ als auch „effectual“ Heuristiken bei der Preisanalyse anwenden. Damit werden die etablierten normativen Preismodelle um die Dimension der Effectuation-Theorie ergänzt, die das Verständnis der realen Preisbildungspraxis unter hoher Unsicherheit und hohem Druck erweitert. Die in dieser Monografie vorgeschlagenen Modelle tragen nicht nur zu einem besseren Verständnis der B2B-Preissetzungspraxis bei, sondern bieten auch eine Orientierung im Informationsverhalten in der Preisgestaltung und bieten so eine Grundlage für weitere Untersuchungen von Managemententscheidungen im Pricing. Darüber hinaus liefern die Ergebnisse dieser Arbeit wertvolle Erkenntnisse für Unternehmen, die sich fragen, ob sich Investitionen in ihre Preisgestaltung lohnen und wenn ja, wo und wann sie investieren sollten. Da Pricing-Manager:innen die Untersuchungsobjekte dieser Arbeit darstellen, liefern die Ergebnisse Handlungsempfehlungen zur Professionalisierung für die Manager:innen selbst, ihre Vorgesetzten, sowie für die strategische Unternehmensführung.

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Abbreviations

ANOVA	analysis of variance
BU	business unit
chap.	Chapter
e.g.	exempli gratia (lat. for example)
i.a.	inter alia (among others)
ID	information deficit
i.e.	id est (lat. that is)
PRID	price-relevant information deficits
PRIA	price-relevant information analysis
PRS	price relevance sphere
RBV	resource-based view
SME	small and medium-sized enterprises
VIF	various inflation factors
WTP	willingness to pay

Information Behavior in B2B Pricing

Conceptual Development and Assessment of Managerial Strategies in B2B Price-Relevant Information Management

1. Introduction

"... organizations search for and evaluate information in order to make important decisions. In theory, this choice is to be made rationally, based upon complete information [...]. In practice, rational choice-making is muddled by the jostling of interests among organizational stakeholders, bargaining and negotiation between powerful groups and individuals, the limitations and idiosyncrasies of personal choice making, the lack of information, and so on." (Choo, 1996, p. 329)

Today, price management is a more active part of companies' business than it has ever been. The megatrends of this century disrupt traditional business models; globalization intensifies competition across industries, digitization fosters (price) transparency, and companies have to refine the value they create for customers. This evolution of the business world means that only companies able to adapt fast enough to these new market situations will be able to build sustainable competitive advantages. With the challenges arising from said megatrends, price management has evolved from being the result of market dynamics to being a core strategic and operative capability of companies. Through active price management companies can, on the one hand, signal value and positioning to the market, and on the other hand, drive their companies' profits (e.g., Nagle & Müller, 2018).

Therefore, price decisions are crucial to firm performance in terms of market shares as well as profits. Compared to cost reductions, successfully implemented price increases have a more powerful lever on profits (e.g., Dutta, Zbaracki, & Bergen, 2003; Iyer, Xiao, & Nicholson, 2015). Yet, situations of price decisions are often characterized by uncertainty (Achterberg, Omar, Ambituuni, & Roll, 2018), idiosyncrasies of decision takers (Mario, 2017), conflicting interests (Lancioni, Schaur, & Smith, 2005), and incomplete information with much noise (Feurer, Schuhmacher, & Kuester, 2019; Lancioni, 2005). Unsurprisingly, price decisions were often found to be irrational, based on intuition and gut feelings (Bogomolova, Szabo, & Kennedy, 2017; Feurer et al., 2019; Rusetski, 2014), relying heavily on imprecise information (Ingenbleek, Frambach, & Verhallen, 2013; Kienzler, 2018), or to be overruled by top management (Liozu & Hinterhuber, 2013a).

Nevertheless, pricing managers have started to re-think their activities in response to said market changes and introduced innovative methods, such as value-based or dynamic pricing. Yet, these methods are even more dependent on accurate and especially on timely information. In combination with the characteristics of decision situations, the increased quantity of information, its short half-life, and the inseparable mixture of reliable and unreliable information increasingly cause problems in pricing. Attempts to reduce the imminent information overload by employing pricing tools with machine learning or artificial intelligence have often not led to satisfactory results (Höhmann &

Simon, 2018). At the same time, information sources that are always up-to-date and reliable are scarce, which jeopardizes informed price decision making (Iyer et al., 2015).

The importance of price decisions for company success in combination with the characteristics of price decision situations render information acquisition a major strategic pricing capability (Achterberg et al., 2018). Regarding pricing capabilities, a wide-ranged study by Bain & Company found that "high-performance companies invest in the capabilities of their pricing teams." (Kermisch & Burns, 2018, p. 50). Yet they also state that "this contradicts the norm of many B2B sales organizations, that offer few or even no formal training in this area" (Kermisch & Burns, 2018, p. 50).

The market volatility, the intensified competition, and the problems of information management cannot be expected to decrease in the future. Especially in the presence of external shocks, such as the covid-19 pandemic, being able to act on available information is a crucial capability for every company. "Indeed, ignoring the informational prerequisites of pricing decisions might jeopardize the firm's existence, because profitability cannot be sustainably ensured" (Achterberg et al., 2018, p. 886). Therefore, it is necessary that research and practice gain in-depth knowledge on how information management is conducted and which factors can help to strengthen price analysis. The professionalization of price analysis will lead to more informed, and therefore more precise, price decisions.

This thesis is dedicated to the understanding of price analysis as the basis for professionalized price decisions. Therefore, this thesis will contribute to building scientific knowledge on price analysis by conceptualizing and assessing price information behavior.

2. Theoretical Gap and Business Application of Price-Relevant Information Analysis

"Indeed, ignoring the informational prerequisites of pricing decisions might jeopardize the firm's existence, because profitability cannot be sustainably ensured." (Achterberg et al., 2018)

The research objective of this thesis was derived through an inductive approach and is therefore firmly grounded in daily B2B pricing problems. Thus, in this chapter it will be established that the practical relevance of this thesis stems from a wide-spread structural problem in price setting, which pricing literature has so far not sufficiently addressed.

2.1. From Normative Pricing Models to Information Needs

Although researchers have been emphasizing the need for a deeper understanding of B2B pricing, research in this area is still sparse (i.a. Homburg & Totzek, 2011; Indounas, 2020; Iyer et al., 2015; LaPlaca & Katrichis, 2009; Reid & Plank, 2000; Sheth & Sharma, 2006). "Despite the above consensus regarding the significance of pricing a new B2B product, a review of the existing literature reveals that only a few empirical studies have been conducted on this field" (Indounas, 2020, p. 1861). Kienzler and Kowalkowski (2017) conducted a literature review on pricing strategy and found that in major marketing journals the published articles regarding B2B pricing are sparse. With respect to pricing strategy, B2B-specific articles only amount to one fifth of the number of articles with a B2C focus (Kienzler & Kowalkowski, 2017). Other authors criticize the lack of empirical studies investigating B2B pricing (Indounas, 2020; Iyer et al., 2015) as well as the missing focus on real-world pricing practices (Ingenbleek, Debruyne, Frambach, & Verhallen, 2003). Unsurprisingly, current research agendas name B2B pricing and its foundations as a priority for future pricing research (Hinterhuber & Liozu, 2017; Iyer et al., 2015; Kienzler & Kowalkowski, 2017; Scholl & Totzek, 2010). „The literature speaks of 'organizational capabilities' and describes organizations as 'innovative'; however, organizations do not have capabilities, individuals do; organizations are not innovative, individuals are" (Hinterhuber & Liozu, 2017, pp. 159–160). Especially the phase of price-relevant information analysis has been under-researched at the time of writing this thesis (Achterberg et al., 2018).

Normative pricing models presented in established literature do not represent major characteristics of pricing practices (Ingenbleek et al., 2013). This leads to several shortcomings of said models, one of them being theoretical information needs that are usually not met in real-world pricing processes (cf. chap. 2.2). As a consequence, normative pricing models are in danger of losing track of real-world pricing. As Iyer et al. (2015, p. 14) put it: "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." Researchers have investigated the symptoms of such

deviations from normative processes, such as informal pricing plans (Lancioni, 1997), informal information exchange and experience-based information (Farley, Howard, & Hulbert, 1971), pricing decisions as "black boxes" (Sheth & Sharma, 2006, p. 425) or intuitive price decisions (Diller, 2008; Oxenfeldt, 1973; Reinecke & Hahn, 2003), as well as behavioral aspects of price decisions (Hinterhuber, 2015; Iyer et al., 2015), and coordination mechanisms (Farley et al., 1971; Lancioni et al., 2005; Narver & Slater, 2012). However, scientific considerations of B2B price-setting processes and the underlying concepts lack empirical evidence that would foster a common understanding of B2B pricing practices (Iyer et al., 2015). So far, the focus of pricing research has mainly been on pricing decisions, their degree of rationality, and their organizational levels. Yet, the most crucial aspect of any pricing decision is the information set it relies on (Achterberg et al., 2018). This raises the topics of information behavior, information processing and information collection in the phase of price analysis, which all have been widely neglected so far. Only with this kind of understanding will it be possible to formulate actionable management recommendations and, in the process, effectively professionalize pricing (Iyer et al., 2015).

2.2. Pricing Practices and the Value of Information

Price-relevant information analysis is a central task and a major concern for pricing units. It is the basis for any pricing decision taken in companies (Achterberg et al., 2018; Lancioni, 2005). Therefore, price analysis is a crucial and powerful determinant of effective pricing as any price decision can only be as good as the information it is based on. This, in turn, generates significant leverage on firm performance (e.g., Burkert, Ivens, Henneberg, & Schradi, 2017; Frenzen, Hansen, Krafft, Mantrala, & Schmidt, 2010; Liozu, 2021; Liozu & Hinterhuber, 2013b). Yet, price analysis in practice is often neither a structured nor a standardized task, despite theoretical pricing models suggesting otherwise. Established normative pricing models do not reflect the following conditions of B2B price setting:

- **Pressure**: Pricing is a complex task usually performed under time pressure and/or pressure to act (cf. Rusetski, 2014). Therefore, time frames for information seeking are usually short and reactions to market developments must be ever more immediate. This pressure results in price decisions being made ad hoc, intuitively or even without considering consequences (Davidson & Simonetto, 2005a; Feurer et al., 2019; Lancioni, 2005; Montgomery, Moore, & Urbany, 2005; Oxenfeldt, 1973; Reinecke & Hahn, 2003; Rullkötter, 2008; Scholl & Totzek, 2010)
- **Transparency of information**: The available sets of information are situational with regard to their level of transparency. Pricing units are strongly dependent on information sources from outside their own unit (Farley et al., 1971; Indounas, 2020; Michelson, 2004). On the one hand, they depend on the disciplined documentation and collaboration of other business units within their company, thus creating a high

potential for conflicts and preventing standardization (e.g., Rullkötter, 2008). On the other hand, pricing units depend on openly available information (e.g. from Michelson, 2004). These dependencies lead to volatile information situations that require individual responses from pricing managers[1].

- **Information reliability**: Price information is valuable. Therefore, holders of price information often use their information and the resulting power strategically and selectively: Finance & Controlling aims to secure revenues through prices (Lancioni et al., 2005), Sales is inclined to underestimate customers' willingness to pay and is often otherwise incentivized (e.g., according to quantities) (Simester & Zhang, 2020), and Product Development might overvalue their own products (cf. Norton, Mochon, & Ariely, 2012). In fact, Lancioni et al. (2005) found that "internal company politics, a lack of understanding of the importance of a planned price setting, or management cultures that do not place a high priority on pricing" prevent a successful implementation of the pricing process. Information from outside the company, especially when obtained from customers, has to be treated with particular caution. With the professionalization of buying centers (e.g., Bendixen, Bukasa, & Abratt, 2004; Ferguson & Mohan, 2019; Henke, Parameswaran, & Mohan Pisharodi, 2008; Jap, 2007; Z. Jiang, Shiu, Henneberg, & Naude, 2016; Steward, Narus, Roehm, & Ritz, 2019; Wiltinger, 1998), the information shared in these encounters can be expected to pursue specific ends. All these circumstances result in selective reporting, low reliability of single pieces of information, and the need for rigorous validation processes.
- **Information deficits**: Pricing managers operate in a complex environment (e.g., Feurer et al., 2019; Iyer et al., 2015) with a wide range of interdependencies (Herrmann, 2003; Lancioni, 2005). In combination with the previous two points (transparency and information reliability), pricing managers often face information deficits. Iyer et al. (2015) found that during the pricing process information "beyond what is available or can be obtained" may be needed. Information deficits can therefore be a reason for suboptimal prices. Companies have been advised to professionalize their information and coordination processes in order to adapt their pricing adequately and in time to market developments (e.g., Totzek & Alavi, 2010a).

So, while relevant and reliable information may be hard to come by, it offers multiple benefits to companies: Firstly, information has the power to sustain a comparative

[1] In this work the term "pricing manager" is understood in terms of the "role of a pricing manager" rather than as a job title. This means a pricing manager is defined as any person within a company who is responsible for managing the prices of products or services of said company. Of course, this role might have another name in certain companies or the role of a pricing manager might be included in another position within a company. Here, these people are included in the term pricing manager if and only if they have pricing responsibilities within their company.

advantage. Secondly, information reduces the level of uncertainty for decisions. Lastly, since management decisions have a crucial and direct impact on the productivity of a company, the more informed they are, the better. Consequently, information deficits can be seen as a crucial challenge for companies. In the realm of pricing, information deficits decrease the chance to take informed decisions and thereby lower the probability of tapping into the full potential of pricing. In pricing practice such behavior can lead to unfavorable phenomena:

- Companies fail to properly assess their own level of professionalization in pricing in relation to their competitors. They usually think of their own price management as inferior compared to other companies' and see high potential for professionalization (Homburg, Jensen, & Schuppar, 2004). Since price management is highly dependent on the psychological traits of managers, their influence on pricing decisions should be carefully managed (Hinterhuber, Kienzler, & Liozu, 2021).
- During price analytics the information sets are often not used to their full potential (Indounas, 2020). For example, managers rarely use strategic competitor reasoning as they expect low returns from the respective efforts. Competition information is hard to gain, the deduced predictions are highly uncertain, and especially in new product pricing might distort the own pricing strategy (Hinterhuber et al., 2021; Montgomery et al., 2005). It was also found that managers tend to overuse internal information as attaining it is more straightforward (Indounas, 2020).
- Information processes are unstructured, individual, fragile and can even be informal (Indounas, 2020; Lancioni et al., 2005)
- Companies are forced into structural price reductions due to customers' demands (Maurer, Dietz, & Lang, 2004; Weber, 2004). This provokes intra-organizational conflicts of interest in pricing decisions.
    - Due to the professionalization of buying centers and customers' international connectivity, price decisions have to be coordinated internationally. Therefore, information management and analysis has to obtain international information and coordinate information analysis internationally (Christian Belz & Mühlmeyer, 2000; Diller, 2004; Diller & Kossmann, 2007; Mühlmeyer & Belz, 2001; K.-H. Sebastian, Niederdrenk, & Wörner, 2000). At the same time the realizable margins tend to decrease (Homburg et al., 2004; Seyfarth, 2007).
    - Prices are defined through intuitive and experience-based assessments of market situations and products (Feurer et al., 2019; Kermisch & Burns, 2018; Reinecke & Hahn, 2003; Scholl & Totzek, 2010; Sheth & Sharma, 2006).

Consequently, timely and accurate information in price setting is decisive for company profits. The way pricing managers attain and process information is therefore of major relevance in pricing practice; understanding this information behavior should be of utmost importance to pricing research. This thesis contributes to an understanding of the

information behavior in price analysis, especially in the light of price-relevant information deficits (PRIDs). Thereby, it aims to produce actionable recommendations for companies that struggle with information management and price analysis. Simultaneously, this thesis attempts to further close the previously described gap between the representation of normative pricing models and real-world pricing practices.

3. Problem Statement, Research Endeavour, and Contribution

"While research in marketing focuses on developing and refining normative pricing models, the extent to which these models are utilized by practitioners receives much less attention." (Rusetski, 2014, p. 1737)

Information management and information procurement are crucial antecedents for companies' price decisions. As this part of the pricing process is still under-researched, the information behavior of pricing managers lies still widely in the dark. Therefore, this thesis addresses the information behavior of pricing managers in price analysis and specifically in the face of price-relevant information deficits which continuously disrupt predefined pricing processes.

Imagine a pricing team being asked to price a new product. Regular pricing processes would require them to find several pieces of information in order to set an adequate price: competitors' prices, customers' willingness to pay, development of raw material costs over time, cost structures of the specific product and so on. Starting with competitors' costs, pricing managers of most B2B companies realize that price lists are not openly accessible and that they risk to arouse the cartel authorities' interest by trying to gain access. When trying to identify customers' willingness to pay, the pricing managers realize that they have no direct access to their own customers. And when they finally get in touch with customers, they realize that customers are usually not telling the whole truth in conversations with sellers or are themselves not aware of their willingness to pay. Proceeding with the last resort, namely costs as a determinant for prices, pricing managers ask their colleagues in the buying center how much the product will cost to produce. Here, B2B pricing managers often receive answers starting with "it depends" and ending with "we will let you know once we have signed some contracts". These are only three examples of how price-setting processes do not follow normative pricing models. Yet, this is not the end of the story. What can pricing managers do when they encounter such problems in finding price-relevant information? How can they cope with the uncertainty caused by information deficits? How can they bridge these information deficits effectively? Finally, how can they still maintain or develop competitive advantage?

Consequently, all research projects of this thesis were guided by the following overall research questions:

RQ1: Which patterns of information behavior disrupt normative pricing models and define price-setting realities?

RQ2: How can patterns of information behavior be used to professionalize price management and thereby positively affect firm performance?

Providing answers to these questions is the main goal of this thesis. The following chapters will present studies that start with the inductively derived management problem of information deficits and lead to information behavior in price analysis, specific heuristics, and finally to the potential of such heuristics (cf. Table 1 for an overview).

	1 Explore	2 Understand Price Analysis		3 Shape Pricing Professionalization		4 Contextualization
Chapter	**Concepts and Relationships at the Intersection of Pricing and Information Science**	**The Reality of B2B Price Analysis – Uncertainty, Information Deficits, Missing Values, and Interruptions**	**Approaches to PRIDs - Strategic Bridging of Information Deficits**	**Causal and Effectual Heuristics in Price Analysis: Drivers and Mediators**	**Causal and Effectual Heuristics - Pricing Managers' Barriers to Switching**	**Mastering the Art and Science of Price Analysis: Discussion and Conclusions**
Chapter Type	Chap. 4: Conceptional chapter	Chap. 6: Theory development	Chap. 7: Typology development (empirical chapter)	Chap. 8: Empirical chapter	Chap. 9: Empirical chapter	Chap 10/11: Conceptional chapter regarding previous results
Research Question	*How do existing concepts relate? How can they be adapted and developed within the realm of price-setting processes?*	*When and under which conditions do pricing managers deviate from normative/planned pricing processes?*	*If a PRID occurs during the pricing process, how do pricing managers approach alternative/substitutive information?*	*What are the drivers of effectuation-/causation-based heuristics in price analysis?*	*When and under which conditions do pricing people switch among types and how can companies support hybrid pricing behavior?*	*When should and how can companies professionalize their price management through information behavior?*
Data Collection	Desk research in three literature streams: information science, pricing and organizational learning	Semi-structured interviews with B2B pricing managers + confirmative expert focus group	Semi-structured interviews with B2B pricing managers + expert focus group	Survey distributed in pricing groups on LinkedIn and within the Pricing Panel	Survey distributed in IfM Management Pool (survey and scenario-based)	
Methodology	Literature review	Grounded theory	Qualitative content analysis	Quantitative methods: multiple regression models, moderation and mediation analysis	Quantitative methods: logistic regression models, interaction analysis	Conclusions and conceptualization of results
Result	Literature overview, concept development, definition of research gaps	Model of price-relevant information deficits ("Price Relevance Model")	Typology of heuristics in price-relevant information analysis	Drivers of causal and effectual heuristics and the definition of supra-pricers	Supra-pricer behavior and its reasons/ incentivization	Concluding conceptual discussion of research evidence and implications

Table 1: The research endeavours of this monograph

The first research project (chap. 4) explores concepts of price setting and their intersection with research streams of information science and behavior. As the research field of B2B pricing – and especially PRIDs – was demonstrated to account only for a small portion of current literature, this thesis starts by addressing the discrepancy between current normative models of price-setting processes and actual pricing practices.

Building on this research gap, the next study (chap. 6) uses Grounded Theory to identify and characterize deviations from normative pricing processes as well as recurrent interruptions. The resulting model describes the information behavior of pricing managers in the face of information deficits. Furthermore, time pressure, the pressure to act quickly as well as high levels of uncertainty regularly are issues in price-setting situations, especially in B2B environments. These circumstances are not reflected in current price-setting models. Therefore, the subsequent study develops a typology of heuristics that introduces effectuation theory to the realm of price setting (chap. 6). The results include the definition of four price-setting heuristics, which depend upon the level of market transparency and the underlying logic (causation/effectuation). This model does not only establish an understanding of pricing managers' behavior in price analysis, the results also identify specific patterns of managers in price analysis. These results can be used as a basis for quantitative research on information behavior and ultimately contribute to recommendations for pricing professionalization.

Since the level of market transparency is a well-defined concept, the studies in chapter 8 focus on the antecedents and relationships of the new dimension (effectuation theory) in price setting. It will be demonstrated that pricing managers who flexibly move between causal and effectual heuristics are able to adapt to any market situation and at the same time significantly increase their pricing capabilities. This is crucial for companies since high pricing capabilities are known to positively influence firm performance (Liozu, Feurer, Hinterhuber, & Woodside, 2021; Liozu & Hinterhuber, 2013b) The results reveal specific levers which can be manipulated by companies to re-design pricing managers' information behavior and develop so-called "supra-pricers". The engagement of supra-pricers is especially fruitful under specific circumstances, such as intense competition. The final section of this chapter therefore discusses when and under which conditions it is profitable for companies to develop and employ supra-pricers.

The concept of supra-pricers is further developed in the subsequent study (chap. 9) by observing pricing managers' switching behavior in scenario-based settings and investigating the reported challenges. It is found that most pricing managers respect the stopping rule conceptualized in the Price Relevance Model presented in chapter 6. In other words, pricing managers acted in the presented scenarios according to information efficiency and stopped information seeking when they expected no return from further analyses. Interestingly, skills and inter-departmental cooperation were not considered a problem in the scenario-based settings. This points towards pricing managers' hands-on

attitudes in pricing tasks, positive pricing cultures, and their belief that they will find help within the company when needed. Yet, time pressure and conflicts between operative and strategic pricing authorities were confirmed as major challenges for the application of supra-pricing behavior.

Throughout all these research projects, this thesis follows three major principles which distinguish it from previous research projects: First, it focuses on a phase of the pricing process which so far has been widely neglected but nevertheless shows an immense importance in the daily operations of pricing managers. Second, pricing managers are the research objects in all studies. Due to difficulty of access and secrecy of pricing topics, previous marketing research has mostly focused on pricing decision takers or decisions as such. Yet, decision takers and pricing managers are usually not the same people and often not represented by the same roles within a company. Third, in line with the inductive approach, the research projects all develop closely along pricing realities in the market. Therefore, this thesis implements this last principle by measures such as the management journey (Schmutz & Reinecke, 2020) as well as the recruitment of a Pricing Panel (chap. 5) as a gatekeeper for relevance.

In the final discussion (chap. 10) the findings of all the conducted research projects are synthesized. The results contribute to answering the research questions by establishing the following points: Firstly, by deepening the understanding of price-setting practices by adding the effectuation dimension and, thereby, the notion of uncertainty, stress and pressure to current normative models. Secondly, by extending the current body of literature by researching antecedents of pricing capabilities and firm performance, namely information behavior patterns and underlying logics. And thirdly, by identifying the levers for price-setting professionalization on the individual and the pricing-center level.

In summary, the findings of this thesis contribute to pricing theory in several ways: They deepen the understanding of real-world price-setting processes and add a novel perspective to existing pricing models. By drawing on literature streams of information behavior and strategic management and combining them with empirical evidence from B2B pricing, this thesis adds to the process of closing a highly relevant gap between theory and practice: information behavior in price-relevant information analysis. Furthermore, this thesis conceptualizes B2B pricing practices with regard to information processing and information management and puts them into the context of pricing situations. Price-setting processes usually regard price analysis as an operative phase of price setting. The results of this thesis will highlight the importance of price analysis in terms of resources, time and influence. Lastly, the findings may be transferred and generalized to other business units which are also challenged by information deficits.

Finally, the results contribute to active price management and its professionalization. Understanding, explaining, and synthesizing price management practices that lead to

more or less successful pricing measures carries is of intrinsic value to pricing managers. Furthermore, it will help them benchmark themselves in their professionalization and thus can help them define their potential as well as precise further milestones in their professionalization process.

4. Literature Review

Reviewing published literature on the relevant research streams, the field of B2B pricing can be structured according to its levels of granularity (Fig. 1). The first question is how authors distinguish B2B structures and pricing realities from other fields of business (subchap. 4.1). Next, the field of B2B pricing is structured and major research publications with related authors are discussed. This approach leads to a precise positioning of this thesis' research endeavor within the field of pricing, namely price-setting processes (subchap. 4.2). Next, approaches of the established literature to price-setting processes are aggregated in subchapter 4.3. It is argued that these price-setting models implicitly provide sufficient and necessary information sets for price setting. In order to understand the particular importance of information and its implications for this thesis, the following subchapter (4.4) provides insights into the term "information" in literature, as well as into information management and behavior. Thereby, a sound foundation is laid for appropriate working definitions of the terms "price-relevant" as well as "information" and, accordingly, the central term of this thesis, "price-relevant information deficits" (PRIDs). Furthermore this subchapter explains how management science was impacted by developments in information science, i.e., since information became recognized as a production factor in its own right. Finally in this subchapter information behavior and pricing are connected to the third research stream of management strategies and underlying logics. Resource-oriented and goal-oriented management strategies are introduced as problem solving measures of pricing managers. The last subchapter (4.5) summarizes findings from the explorative literature review of said three research streams and concludes with summarizing the results relevant for this thesis.

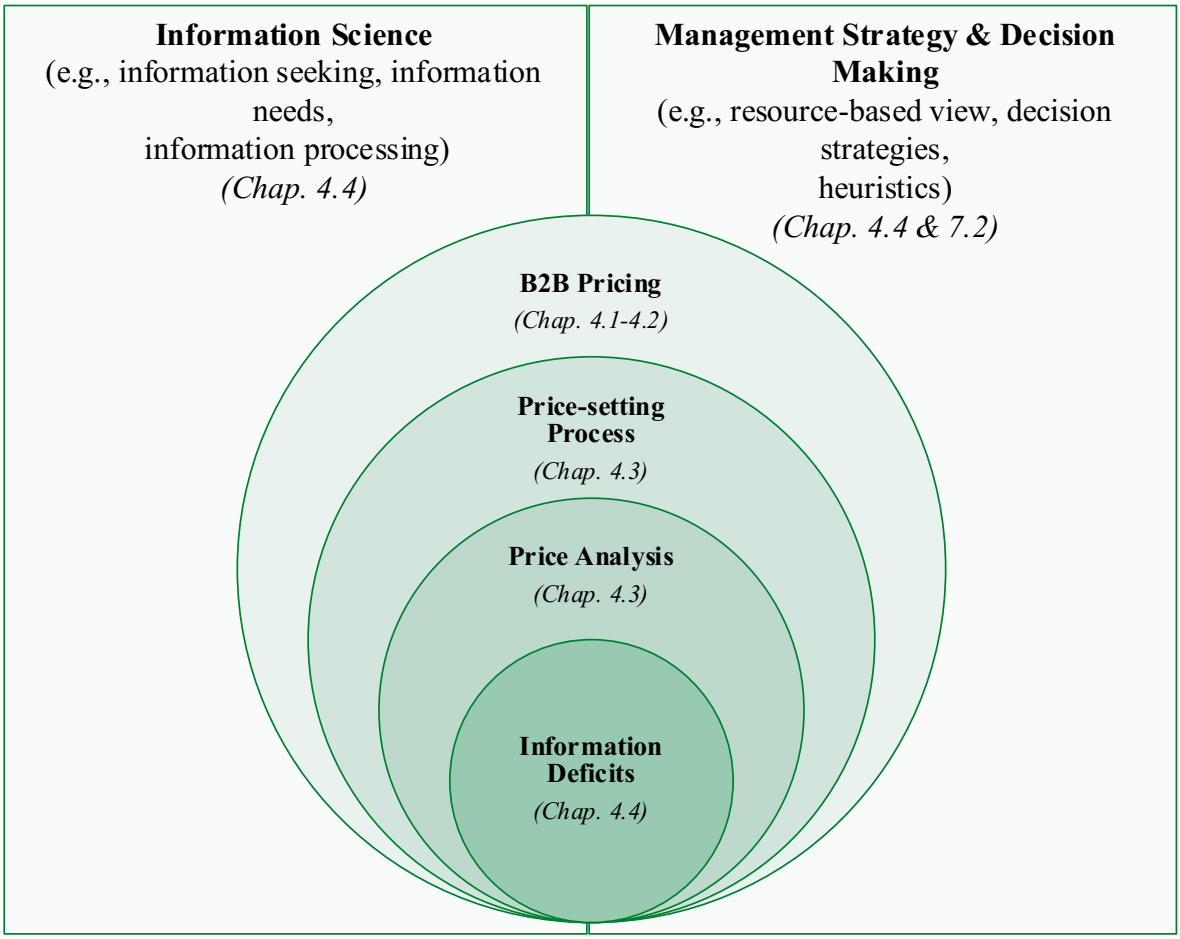


Fig. 1: Delineation of the research streams and the respective chapters

4.1. Characteristics of "B2B Pricing" – Why it is Worthwhile to Investigate B2B Separately

"Price management of B2B markets is more complex, less professionalized and at the same time less researched than price management of B2C markets." (Homburg & Totzek, 2011)

B2B pricing is characterized by some specific features which need to be understood to enable differentiation from pricing within other business contexts (Kienzler & Kowalkowski, 2017; Reid & Plank, 2000). Detailed descriptions of B2B characteristics are provided, among others, by Backhaus & Voeth (2015a, 2015b), while specifications regarding B2B pricing can be found, for example, in Homburg & Totzek (2011) and Totzek (2011). The following list summarizes the most distinctive characteristics of B2B pricing and their effects based on a systematic literature review of pricing publications.

- **Higher impact of price (changes)**: Prices and especially price changes can cause a relatively high impact on revenues due to volumes and binding contract periods

(e.g., Diller, 2008, p. 21; Monroe, 1990; Nagle & Müller, 2018; Shipley & Jobber, 2001, p. 301).

- **Duality of B2B markets:** Lack of information transparency in B2B markets and at the same time the familiarity due to the usually small number of market players are two characteristic principles of B2B markets. On the one hand, legal restrictions (cartel law) and technological dynamics lead to highly intransparent international markets. On the other hand, the number of market players within an industry or product group is usually small, and digital platforms and fairs support regular exchange and exploration (e.g., Shipley & Jobber, 2001). This duality can lead to a perceived transparency that is based on information of strongly varying reliability.
- **"People buy from people" – buyer–seller relationships:** Buyer–seller relationships – provide great value for both sides, i.e., suppliers as well as customers. Due to their high importance these business relationships are carefully fostered. Personal sympathies as well as the conflictual relationship between company goals and customer relationships determine final prices (e.g., Cannon & Perreault, 1999; Henke et al., 2008; Homburg, Allmann, & Totzek, 2012; Saab & Botelho, 2020). These relationships can have economic consequences for the involved parties (Granovetter, 1985), influence pricing strategies (Töytäri, Rajala, & Alejandro, 2015), increase the customers' willingness to pay (WTP) (Palmatier, Scheer, Houston, Evans, & Gopalakrishna, 2007), influence the discounting behavior of sales personnel (Lawrence, Crecelius, Scheer, & Patil, 2019; Simester & Zhang, 2020), and positively impact sellers' corporate performance (Frenzen et al., 2010). Unfolding all the positive effects of buyer–seller relationships requires the human contact with sales personnel (e.g., Käuferle & Reinartz, 2015; Lawrence et al., 2019), which may only be complemented by remote and offline contacts (e.g., Lawrence et al., 2019; Paschen, Wilson, & Ferreira, 2020).
- **Negotiations:** In contrast to B2C, prices realized in B2B markets are determined through negotiations that follow offers based on list prices (e.g., Shipley & Jobber, 2001). This leads to difficult and often cost-intensive price comparisons among suppliers. At the same time, individual boni and rebates, contract conditions and information asymmetries as well as negotiation skills and power are of significant importance (e.g., Geiger & Hüffmeier, 2020; Lawrence et al., 2019; Moosmayer, Chong, Liu, & Schuppar, 2013; Moosmayer, Schuppar, & Siems, 2012). The outcome of these negotiations depends on several factors, such as the distribution of pricing authority within the selling company (Homburg, Jensen, & Hahn, 2012) or reference prices and initial price offering provided by sales people (Moosmayer et al., 2012). This lack of transparency with regard to realized prices as well as the fact that the success of pricing measures depends on

salespeople's negotiations increases the pressure on pricing and leads to iterative actions in price setting that are not reflected in normative pricing models.

- **Market regulation regarding price information:** In contrast to B2C markets, realized prices are (almost) never equal to list prices. The delta between realized prices and list prices depends on many factors specific to B2B pricing (negotiations, rebates, boni etc.) and is therefore difficult to extrapolate. Direct access to such pricing information is regulated by cartel and competition laws. The availability of price information is therefore strongly limited, not least because audits and verdicts endanger the previously mentioned value of customer relationships and trust. Due to the limited access to information, B2B pricing is usually characterized by situations of high uncertainty, which is not reflected in current price-setting models.
- **Waves of professionalization – buying, selling, and pricing centers:** After the professionalization of buying centers (Johnston & Bonoma, 1981; Steward et al., 2019; F. E. Webster & Wind, 1972) companies reacted to the new, highly efficient buying teams with the professionalization of their selling units (Johnson & Friend, 2015; Simester & Zhang, 2020; Terho, Eggert, Ulaga, Haas, & Böhm, 2017). Consequently, new processes, monitoring systems, incentive structures and multi-personal decision systems arose in buying and selling. These developments exert an indirect but also direct influence on prices, which in turn requires active price management. Therefore, a third wave, that of pricing professionalization, has started in the 2000s and is still ongoing. Professionalization in B2B pricing requires information management, tacit knowledge, documentation of pricing decision logics, and supporting price tools. Yet, the increase in decision quality comes with longer response times and conflicts of interest that have to be resolved first (e.g., Frenzen et al., 2010; Hinterhuber, 2015; Homburg, Jensen, et al., 2012; Liozu & Hinterhuber, 2013a).

These characteristics lead to the conclusion that the B2B context holds unique challenges and demands high degrees of foresight. Pricing units have to capture and understand the interdisciplinarity of pricing as well as the interdependencies within companies. Different strategies and incentives regularly induce internal conflicts within companies that also affect pricing. This is why pricing units may also act as mediators among business units as well as between units and the upper management. Pricing managers need a specific set of capabilities and skills in information as well as coordination management in order to guide their company to efficient pricing.

The characteristics described above all add to the argument that B2B pricing is a field of research with sufficient specific characteristics to warrant a separate investigation. Not surprisingly, the research field of "B2B pricing" has been constantly growing within

the last decade. Therefore, the following subchapter will sketch B2B pricing groundworks as well as recent developments in pricing research.

4.2. The Research Field "B2B Pricing"

"Pricing is quite simply too important to forego deep analyses of the relevant company and market influences." (Shipley & Jobber, 2001, p. 301)

When structuring the research field of B2B pricing, the company perspective as well as market influences can be used for orientation. Table 2 gives an overview, with six research clusters ordered (from left to right) according to their degree of inbound and outbound perspective on pricing. The inbound orientation, on the one hand, describes aspects of pricing which mainly regard companies' internal matters: pricing organization, pricing processes, and pricing strategies. Crucial questions within these fields are: Who do pricing teams report to? With which business unit(s) are they related? Who has decision-making power? Which medium- and long-term goals are to be achieved by means of pricing policies? On the other hand, pricing research with an outbound orientation concentrates on price implementation, price effects, price communication, and other customer-related price aspects. Research in these fields poses questions such as: How are price negotiations effectively conducted? Which roles and figures have an influence on negotiations? How can buyer–seller relationships be designed and used? How can prices (or price changes) be effectively implemented?

For each cluster Table 1 provides an indicative but not exhaustive list of relevant publications.

Pricing Organization	Pricing Process	Pricing Policy (Strategy & Methods)	Price Effects, Price Communication	Price Negotiations, Rebates and Boni	Customer-related Pricing Topics
Pricing organization & culture (Burkert et al., 2017; Homburg & Pflesser, 2000; Liozu, 2021; Totzek & Alavi, 2010b) **Pricing teams, committees, and individuals' contribution** (Feurer et al., 2019; Hinterhuber et al., 2021; Liozu, 2021; Liozu, Hinterhuber, Perelli, & Boland, 2012) **Decision takers, hierarchy & pricing authority (**Frenzen et al., 2010; Hague, 1971; Homburg, Jensen, et al., 2012; Liozu & Hinterhuber, 2013a; Mishra & Prasad, 2005; Oxenfeldt, 1973) **Interdependency & conflicts of interest** (Dutta et al., 2003; Lancioni et al., 2005; Liozu et al., 2021;	**Price-setting process models** - **In general** (Diller & Kossmann, 2007; Esch, Herrmann, & Sattler, 2017; Iyer et al., 2015; Kossmann, 2008b; Kotler, Keller, & Opresnik, 2017; Lancioni, 2005; Nagle, Holden, & Larsen, 1998; Reinecke & Hahn, 2003; Hermann Simon & Fassnacht, 2016, 2019) - **B2B specific** (Dutta et al., 2003; Homburg & Totzek, 2011; Hutt & Speh, 2006; Hwang, Tsai, Yu, & Chang, 2011a; Shipley & Jobber, 2001; Wright, 2004) **Informal pricing** (Feurer et al., 2019; Lancioni, 1997, 2005) **Price decision** (Alirezaee & Sadjadi, 2019; Bertini,	**Pricing strategy** (Davidson & Simonetto, 2005b; Gale & Swire, 2012; Johnston & Mora Cortez, 2018; Kienzler & Kowalkowski, 2017; Luoma, Falk, Totzek, Tikkanen, & Mrozek, 2018; Nagle & Müller, 2018; Richards, Reynolds, & Hammerstein, 2005; Shipley & Jobber, 2001; Tellis, 1986) **Use of pricing methods** (Gerpott, 2016; Gerpott & Schneider, 2016; Indounas, 2019; B. Jiang, Sudhir, & Zou, 2020; Johansson et al., 2015; Kienzler, 2018; Krämer & Schmutz, 2020; Nagle et al., 1998; Pilehvar, Elmaghraby, & Gopal, 2017; Shipley & Jobber, 2001; Stoppel & Roth, 2017)	**Relative price & price volatility** (Chandrasekaran, Arts, Tellis, & Frambach, 2013) **Price perception & behavioral price research** (Hoyer, Herrmann, & Huber, 2002; Miniard, Mohammed, Barone, & Alvarez, 2013; Monroe et al., 2015; Palmatier et al., 2007; Peine, Heitmann, & Herrmann, 2009) **Pricing effectiveness** (Bogomolova et al., 2017; Carricano, 2014; Gale & Swire, 2012; Gijsenberg, 2016; Liozu et al., 2021) **Competition** (Heil & Helsen, 2001; Ingenbleek et al., 2013; Iyer et al., 2015; Kadiyali, Vilcassim, & Chintagunta, 1996; Montgomery et al.,	**Negotiations** (Geiger & Hüffmeier, 2020; Moosmayer et al., 2013, 2012; Paschen et al., 2020; Saab & Botelho, 2020) **Collaboration with stakeholders** (Alirezaee & Sadjadi, 2019; Formentini & Romano, 2016) **Price reductions and discounts** (Henke et al., 2008; Hwang, Tsai, Yu, & Chang, 2011b; Lawrence et al., 2019; Peine et al., 2009; Simester & Zhang, 2020)	Relationships between seller and buyer (Alirezaee & Sadjadi, 2019; Chu, Yeo, Ee, & Lai, 2020; Henke et al., 2008; Homburg, Allmann, et al., 2012; Jap, 2007; Käuferle & Reinartz, 2015; Li & Jhang-Li, 2011; Palmatier et al., 2007) **Buying/Selling Center** (Anderson & Oliver, 1987; Anderson, Thomson, & Wynstra, 2000; Anderson & Wynstra, 2010; Johnson & Friend, 2015; Kossmann, 2008b; Pepels, 2006; Saab & Botelho, 2020; Webster & Wind, 1972) **Change/transition reluctance** (Lam, Shankar, Erramilli, & Murthy, 2004; Nagengast,

Shipley & Jobber, 2001) **Success factors of intra-organizational pricing policy** (Hinterhuber et al., 2021; Ingenbleek, 2007b; Liozu et al., 2021) **Pricing capabilities** (Carricano, Trinquecoste, & Mondejar, 2010; Dutta et al., 2003; Hinterhuber, 2017; Johansson, Hallberg, Hinterhuber, Zbaracki, & Liozu, 2012; Johansson, Keränen, Hinterhuber, Liozu, & Andersson, 2015; Liozu, 2016; Liozu & Hinterhuber, 2014; Noble & Gruca, 1999b; Zawada & Marn, 2012)	Halbheer, & Koenigsberg, 2020; Kispál-Vitai, 2019; Monroe, Rikala, & Somervuori, 2015) **Price implementation and controlling** (Florissen, 2008; Kossmann, 2008b; Liozu, 2021; Reinecke & Hahn, 2003; Shipley & Jobber, 2001; Terho et al., 2017) **Heuristics, biases and behavioral aspects** (Achterberg et al., 2018; Bogomolova et al., 2017; Bollinger & Hartmann, 2020; Cohen, Perakis, & Pindyck, 2021; Feurer et al., 2019; Homburg, Totzek, & Krämer, 2014; Iyer et al., 2015; Kienzler, 2018; Rusetski, 2014; Saab & Botelho, 2020)	**Choice of method** (Liozu et al., 2021; Nagle & Müller, 2018; Noble & Gruca, 1999a; Töytäri, Keränen, & Rajala, 2017; Töytäri et al., 2015) **Complexity of pricing** (Homburg et al., 2014; Liozu & Hinterhuber, 2013a) **Price wars** (Heil & Helsen, 2001; Luoma et al., 2018; Totzek, 2011) **Technology in pricing** (Bollinger & Hartmann, 2020; Davenport, Guha, Grewal, & Bressgott, 2019; Frenzen et al., 2010; Lawrence et al., 2019; Paschen et al., 2020; Wirth, 2018)	2005; Totzek, 2011; Trento, Stüker, Pereira, Borchardt, & Viegas, 2016)		Evanschitzky, Blut, & Rudolph, 2014) **Price sensitivity & complexity** (Homburg et al., 2014; Monroe et al., 2015; Moosmayer et al., 2012) **Customer satisfaction** (Chu et al., 2020; Hoyer et al., 2002; Lam et al., 2004; Steiner, Siems, Weber, & Guhl, 2014)

Table 2: Overview on pricing research

4.3. Price-setting Process Models and (Implicit) Information Requirements

„Pricing decisions should be based on a comprehensive systematic multistage process that examines and integrates the full range of forces that impact pricing effectiveness." (Shipley & Jobber, 2001, p. 301)

For the research objective of this thesis, the research on pricing processes and information analysis in pricing is central. Therefore, this subchapter expands on the publications on pricing process models and derives related or implicit information requirements.

While scholars and journals have been calling for a more intense pursuit of B2B pricing research over the last decade (e.g., Bright, Kiewell, & Kincheloe, 2006; Carricano, 2014; Estalami et al., 2007; Hinterhuber et al., 2021; Indounas, 2020; Kienzler & Kowalkowski, 2017; Reid & Plank, 2000; Simon & Fassnacht, 2016; Totzek & Alavi, 2010a), publications addressing B2B price-setting processes (e.g., Kossmann, 2008a) and, specifically, price information analysis are still sparse. Consequently, this subchapter reviews established price-setting models, derives implicit and explicit information requirements, and links B2B pricing with research on uncertainty.

Previous publications present a number of normative ideal-typical price-setting processes (Dutta et al., 2003; Homburg & Totzek, 2011; Hutt & Speh, 2006; Hwang, Tsai, Yu, & Chang, 2011b; Kotler et al., 2017; Nagle et al., 1998; Reinecke & Hahn, 2003; Shipley & Jobber, 2001; Simon & Fassnacht, 2019; van Esch, Black, & Ferolie, 2019; Wright, 2004). They all separate price setting into four major phases:

- the strategic phase (pricing method, long-term strategy, higher-level decision rules),
- the information processing and analysis phase (information aggregation, procurement, processing, and presentation),
- the price decision phase (price decision and interplay between stakeholders),
- the price implementation & controlling phase (price implementation, follow-ups, analyses, potentially adjustments).

Fig. 2 and Fig. 3 provide an overview of said models, subdivided into price-setting processes in general and those presented specifically in a B2B context. Duke (1994) suggested early on that price setting is a complex, iterative, and interactive decision process, which is intertwined with other departments' tasks. Graphically, this can be seen in the fact that authors agree on the need for certain phases, however, strongly disagree regarding their chronological order. Due to the complexity of the pricing task, models of price setting are usually of an ideal-typical nature (Reinecke & Hahn, 2003).

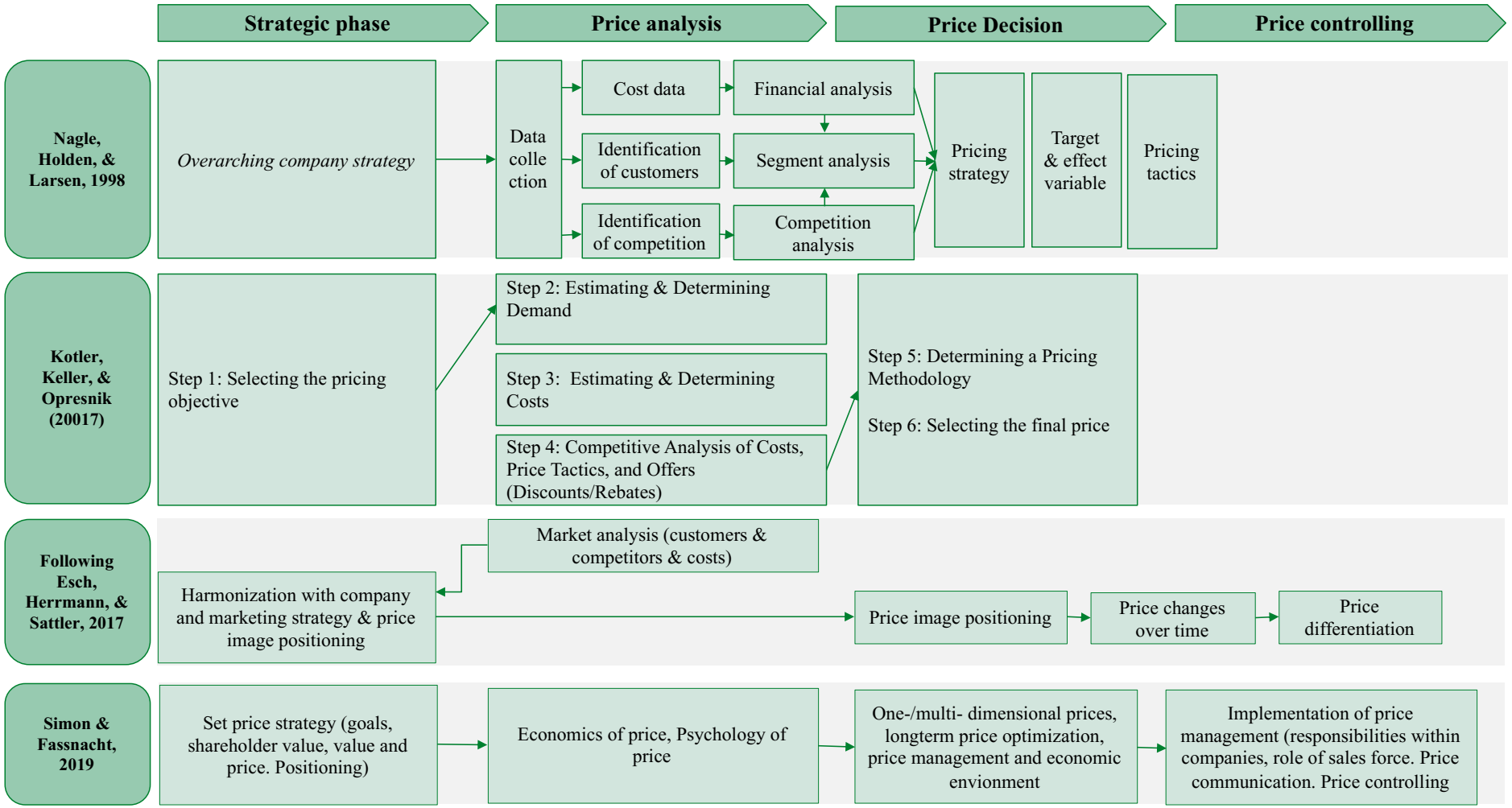
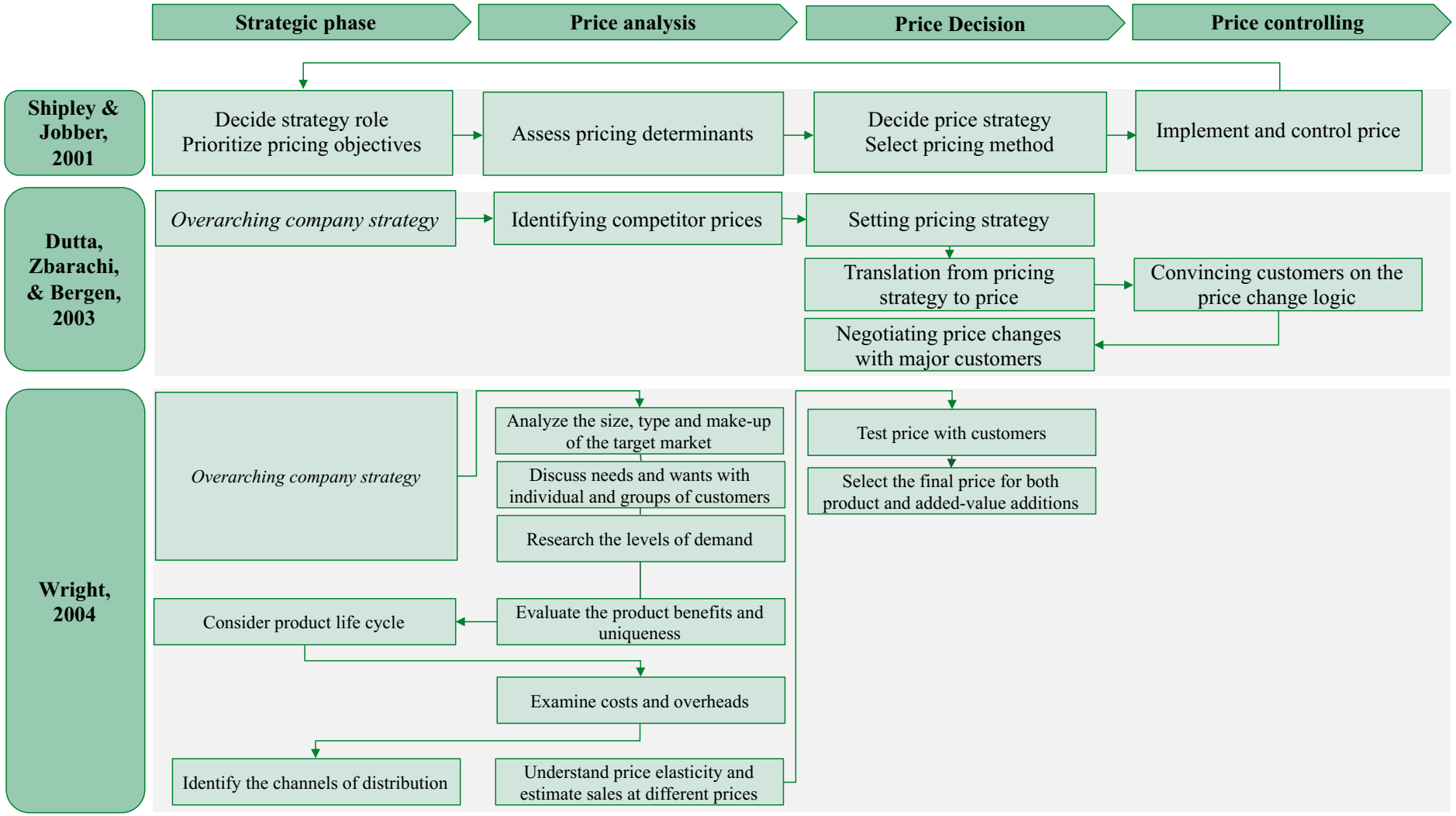


Fig. 2: Price-setting processes in the literature


Strategic phase
Price analysis
Price Decision
Price controlling
Shipley & Jobber, 2001
Decide strategy role
Prioritize pricing objectives
Assess pricing determinants
Decide price strategy
Select pricing method
Implement and control price
Dutta, Zbarachi, & Bergen, 2003
Overarching company strategy
Identifying competitor prices
Setting pricing strategy
Translation from pricing strategy to price
Convincing customers on the price change logic
Negotiating price changes with major customers
Wright, 2004
Overarching company strategy
Analyze the size, type and make-up of the target market
Discuss needs and wants with individual and groups of customers
Research the levels of demand
Evaluate the product benefits and uniqueness
Consider product life cycle
Examine costs and overheads
Identify the channels of distribution
Understand price elasticity and estimate sales at different prices
Test price with customers
Select the final price for both product and added-value additions

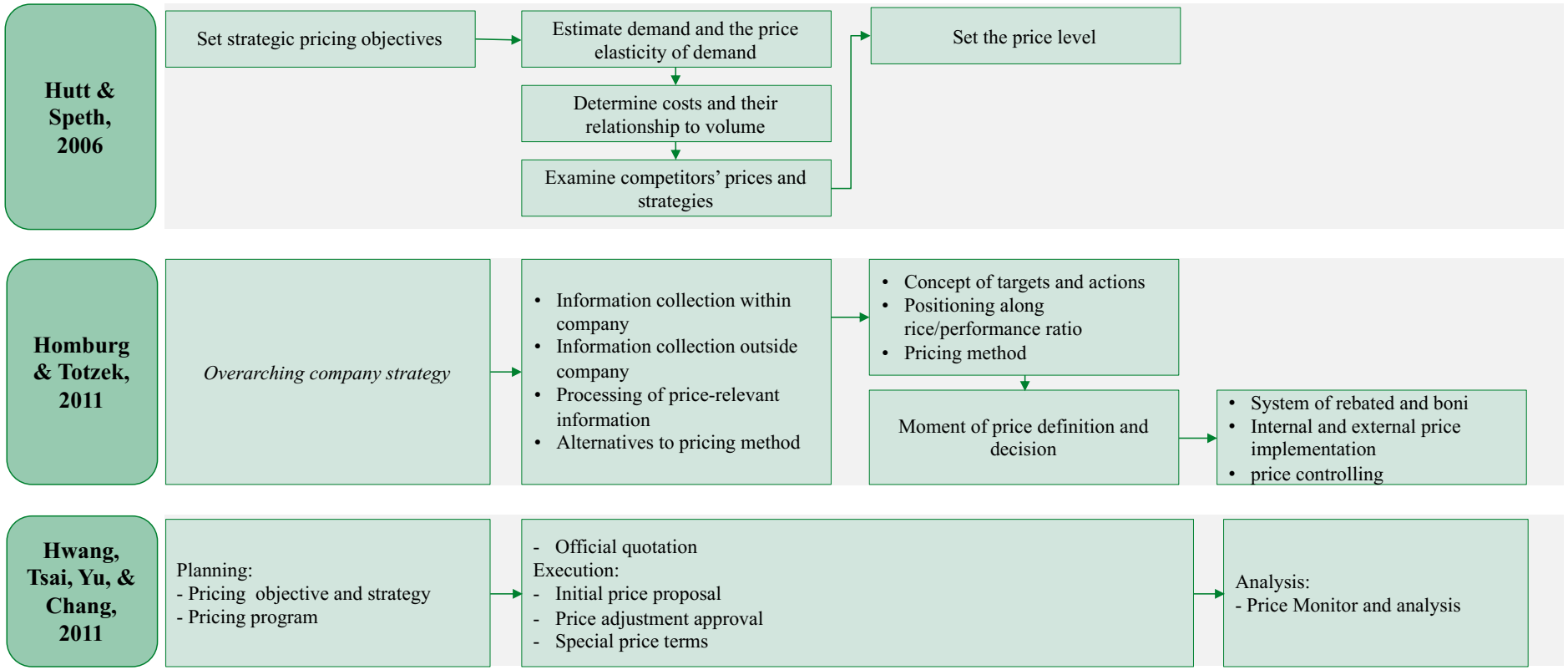


Fig. 3: B2b-price-setting processes in the literature

According to these pricing models, the price analysis phase requires information on all the three dimensions influencing prices: competitors, costs, customers (cf. Ohmae, 1983). While several models take the respective information as given, some of them implicitly acknowledge difficulties in procuring relevant information. The latter describe information analysis as "estimating", "researching" or "discussing" (cf. Fig. 2 and Fig. 3). Especially in B2B-specific pricing processes, authors seem to indirectly account for a certain complexity behind information procurement although they neither address specific information needs nor the granularity of information or the challenges regarding information availability. Yet, "the absence of complete and accurate information may also contribute to prices that are recognized as suboptimal" (Iyer et al., 2015, p. 14).

For most pricing managers these models are far from their pricing realities. In practice, pricing is known to be dependent on environmental, industry-specific and even company-specific factors (Kossmann, 2008a, p. 184). Furthermore, pricing units are considered flexible and quickly adaptable to new inputs or needs (Shipley, 1986; Zimmerman & Blythe, 2018). And lastly, pricing decisions are regularly considered decisions under uncertainty (e.g., Kienzler, 2018; Rajala, 2019). Summarized in Rusetski's words (2014, p. 1740): "While research in marketing focuses on developing and refining normative pricing models, the extent to which these models are utilized by practitioners receives much less attention."

The price-setting processes describe ideal pricing situations instead of managers' realities. Thereby, they may set common ground for professionalized pricing, but they provide little in terms of instructions to get there. In order to understand price setting better and render scientific findings actionable for practitioners it is crucial to pave the way.

Several publications have started to pave the road towards actionable advice for professionalization by inductively researching phenomena which result from real-world pricing processes. Several publications have addressed pricing decisions under situations of uncertainty and limited information. For example, Bearden et al. (2008) focused on decision biases in revenue management, Cohen et al. (2021) research pricing decisions with limited information on demand, and Hinterhuber, Kienzler, and Liozu (2021) connect personal traits of pricing managers to the bounded rationality theorem.

Another stream of literature in a similar attempt addresses concepts of intuition, gut feeling and expertise in price setting. Bogomolova et al. (2017) investigated the intuition and evidence analysis underlying price decisions. Only a few years later, Feurer et al. (2019) published their finding that rationality and intuition are two modes in price setting that drive the effectiveness of a pricing strategy.

Lastly, a major research stream defines the pricing capabilities needed for professional pricing. Within the realm of the resource-based view literature, Dutta et al. (2003)

defined the price-setting process as a capability highlighting the uniqueness and competitive advantage that results from the price setting of companies. Liozu and Hinterhuber (2013b, 2014) proposed a scale of pricing capabilities and link pricing to firm performance. Only recently, Liozu et al. (2021) found configurations and interdependencies within pricing that enhance firm performance.

Despite various research endeavors in price decision making, the analysis phase, which has significant influence on price decisions, has not been researched in detail. Therefore, scientific literature still lacks an understanding of said phase and the information behavior of pricing managers during price analysis. To address this research gap, this thesis draws on concepts and findings from adjacent research streams to explore, describe and explain information behavior in price setting. The relevant concepts are reviewed in the following subchapters.

4.4. The Concept of Information in Scientific Literature Streams

"Information is knowledge in action" (Kuhlen, 1995, p. 34)

Information deficits, information seeking, and reactions related to uncertainty are concepts that have found only little attention in pricing research. Yet, other disciplines have addressed these concepts and provide valuable insights which this thesis transfers to the pricing realm. The relevant findings of said research streams are reviewed in the following subchapters and will contribute to exploring, describing and explaining information deficits in price setting.

Definition(s) of Information

"There are almost as many definitions of information as authors that write about it." (Wersig, 1974, p. 28)

Information is a crucial concept. Virtually every field of research (e.g., computer science and informatics, psychology, linguistics, business administration, politics, social sciences, natural sciences, philosophy) has at some point addressed its understanding of information, the value it attributes to information, and information use within the respective field. For the purpose of investigating the subject of price analysis in companies, an understanding of the fields "business administration" and "information systems" is paramount.

In business administration one of the most popular definitions of "information" was formulated by Wittmann (1959), who understands information as "aim-oriented knowledge", where the "aim" is defined by the preparation of impactful actions (Kirsch, 1977, p. 79; Wittmann, 1959, p. 14, 1980, p. 894). According to this definition the term "information" is understood as that sub-part of knowledge which serves the preparation

of decisions (Krcmar, 2015, p. 15; Pikkemaat, 2002, p. 9). Michelson (2004) further defines that business information serves as the basis for economical behavior and decision making, in that information helps to figure out potential developments of a specific situation and to estimate the impact of certain behaviors and decisions (Michelson, 2004, p. 591). This is a useful understanding for the purpose of this thesis as it excludes knowledge and information acquired as an end in itself, e.g., due to general interest in a topic.

In the field of information systems, Lehner and Maier (1995) propose to extend the general definition by dividing it into an individual and an organizational dimension. The former describes the interpretation of sensations with regard to the individual knowledge (Lehner & Maier, 1995, p. 261). The organizational dimension is explained as "the subset of data which is chosen, sorted, saved and made accessible for internal use in the organization" (Lehner & Maier, 1995, p. 266). This understanding is in line with Müller-Merbach (1995, p. 4), who defines information via a more general description of the term "data": information is goal-oriented data which is useful to a company in a specific context. Usefulness of information was later defined in a meta-analysis by Rajala (2019) to comprise the aspects of relevance, reliability/faithful representation, understandability, compatibility, transparency, credibility, cost efficiency, and legitimacy.

Similar definitions were proposed by Rüttler (1991, p. 29: selected vs. unselected information, i.e. goal-oriented information) and Drucker (1988, p. 46: "data endowed with relevance and purpose"). The pragmatic and consensual definition from an information science point of view refers to notions of relevance, meaning and usefulness of information (Kuhlen, 2013, p. 3).

For the purpose of this intersectional thesis, a working definition is formulated that combines aspects from the information science and information systems understanding of information as well as the one prevailing in business administration. When the research projects of this thesis refer to "information", they refer to information as defined here:

Information is that subset of data or knowledge that is relevant, meaningful and useful in the preparation of a specific decision.

Information Behavior

"What we find changes what we seek." (Morville & Callender, 2010, p. 51)

Bethel (1975) defined the information situation in the context of business decisions as the interplay between information supply, information demand, and information requirement for any business decision. This results is a conflict between the standardization of key performance indicators (KPIs) and individual information needs of decision takers (Reinecke, 2004). The problem of defining the (objective and individual)

information requirements in combination with an information demand, that does often not match the information supply, poses a crucial challenge in the price-setting phase of price analysis (cf. chap. 2 & 4.3).

Therefore in the following, findings on information behavior and specifically information seeking will be summarized and working definitions for the core concepts "information deficit" and "price-relevant information" will be deduced.

Firstly, information science answers the question when and why people – or in their terms users – search for information. Seeking information is considered an approach used for problem solving (e.g., Belkin, 1982; Salado, Morelock, & Lakeh, 2017). Belkin (1982) suggests that the information seeking process starts with a problem encountered by a user. This means the user "*recognizes that her/his state of knowledge is inadequate for resolving that problem, and decides that obtaining information […] is an appropriate means towards its resolution*" (Belkin, 1982, p. 63). The gap between awareness of a problem and the knowledge necessary for solving this problem is called the "information need" (Belkin, 1982). This thesis follows this definition of information need as it focuses on the user, which is in line with the research objective of understanding price management realities in information analysis. Decision theory further distinguishes between objective (with regard to the decision problem) and subjective (individually defined by the decision taker) information needs (Picot & Franck, 1988, p. 609). This means information needs regarding a specific problem might differ among decision takers (or decision stakeholders) (Bahlmann, 1982; Dweck, 1999).

However, Belkin (1982) also cautions that users are often unable to articulate their information needs in detail. This usually changes with an increased understanding of the specific problem. Therefore, when first starting the information seeking process, uncertainty is a frequent experience (Russell-Rose & Tate, 2013). Kuhlthau (1991) modelled the information seeking process with the moods and feelings accompanying each stage. According to her work, after "*focus formulation, a person's sense of direction and confidence increases and actions change from exploring relevant information to seeking and documenting pertinent information*" (Kuhlthau, 1991).

Linking information seeking to the pricing process, it can be said that the phase of price analysis is determined to a large extent by information seeking (and information processing). This holds true for both the descriptions in normative pricing models and the research findings from inductive approaches. In the conclusions of this literature review (Fig. 6 in subchap. 4.5) the price-setting processes are explicitly contrasted and integrated with Kuhlthau's information-seeking process.

Other authors have built on Kuhlthau's information-seeking process, such as Blandford and Attfield (2010) who extended the concept of information seeking to the information

journey model. This model describes four stages, namely: (i) recognition of information need, (ii) acquisition of information, (iii) interpretation and validation, and (iv) use of information (Fig. 4). As information needs can be of an objective or a subjective nature they have to be identified and afterwards communicated (cf. Bahlmann, 1982; Belkin, 1982; Dweck, 1999). Wilson (1997, p. 553) adds another characteristic, namely the function of the respective piece of information: new information, information that explains and clarifies, and information that confirms prior information or beliefs. In information science research it has been noted that the validation, interpretation, and application of information are information interactions that are often overlooked (Pontis, Blandford, Greifeneder, Attalla, & Neal, 2017).

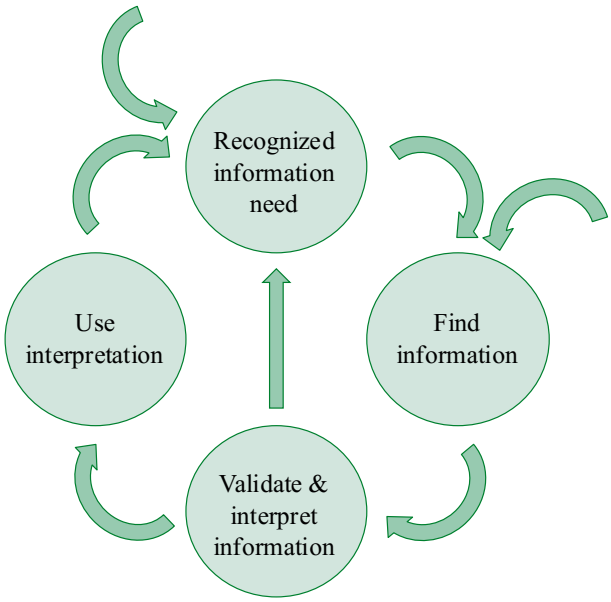


Fig. 4: Information journey model according to Blandford & Attfield (2010)

A number of influences that impact information users during information seeking have been researched: the type of information determines how users perceive and value this information (e.g., Herr, Kardes, & Kim, 1991), prior beliefs affect information processing (e.g., Taber & Lodge, 2006), the same market information will cause different reactions in different agents (e.g., Dweck, 1999), and often the source of information is valued, not just the information itself (Kotler et al., 2017; Rajala, 2019).

A major determinant of information seeking is matching information supply and demand (Berthel, 1975) or, more precisely, the user's expectation: Rajala (2019) found that these expectations – if not met – produce an "information expectation gap", which, in turn, might lead to non-use or misuse of said information. Information expectation gaps can emerge with regard to different aspects of the information: the information provider, the information channel, the information itself, or the context of information use. They are represented in the model of information system dysfunctions in Fig. 5.

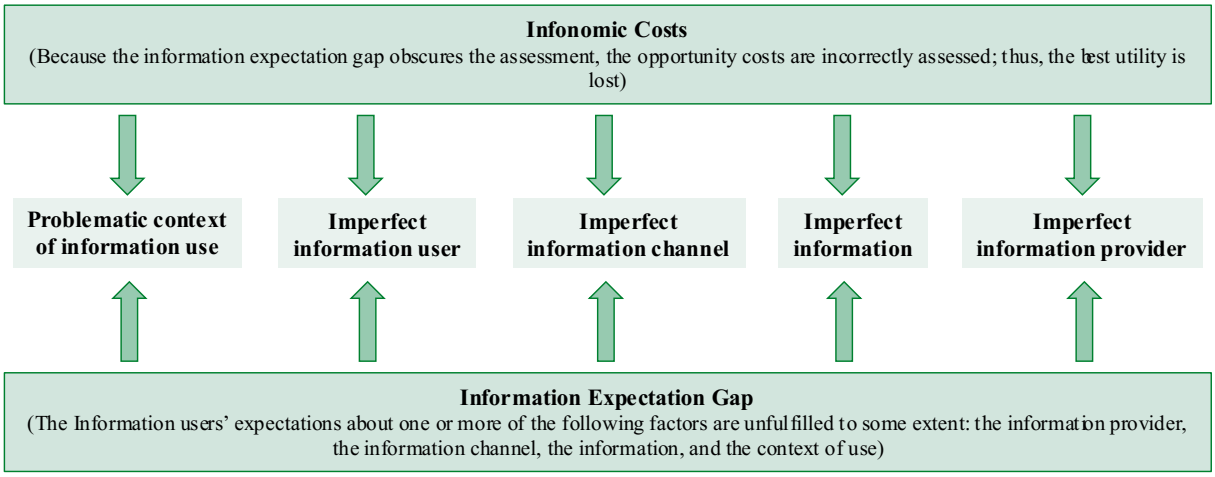


Fig. 5: Information system dysfunctions according to Rajala (2019)

In summary, the insights gained with regard to the field of information behavior lay the ground for understanding pricing managers' actions in response to information deficits. They explain the occurrence of information deficits (due to information system dysfunctions), how they are treated generally and how information-seeking journeys are experienced by users in general. By making this connection, this thesis answers, among other questions, the call for investigating "behavioral and psychological aspects of pricing teams" (Hinterhuber et al., 2021, p. 239).

Price-Relevant Information (Deficits)

This subchapter links information science research with the research objective of this thesis to develop a definition of price-relevant information (deficits) (PRIDs).

Relevance is defined as one of the central determinants of the usefulness of information (Miller, 1996; Rajala, 2019). It describes the fit between the information and the subjective information need (Huang, Lee, & Wang, 1998; Miller, 1996). This means that information that is of high quality according to the other dimensions (timely, reliable, understandable, compatible, transparent, credible, cost efficient and legit) may yet be inadequate if it does not fit the subjective information need of a user, i.e. if the user is not able to use it to solve the knowledge anomaly (Belkin, 1982) or educational problem (Miller, 1996). According to Rajala (2019), relevance comprises the predictive, confirmatory and/or operational values of information.

Therefore, for the purposes of this thesis, price-relevant information is defined as information that addresses price decision stakeholders' (the company, pricing-decision takers, pricing analysts, decision implementers etc.) information needs by allowing for price predictions, confirmation or operational alignment in a specific pricing process.

Following this definition, PRIDs can be defined as the gap in prevailing knowledge (e.g., within a pricing unit) where obtaining the respective information is (according to the users' assessment) an appropriate means to a solution. This definition is adapted from Belkin's (1982) description of "knowledge anomalies".

The Adoption of Information Research in Economics and Management

The fields of economics and management have used findings from information science in their research. Economics addresses the consequences and impacts of a lack of information on economic systems (e.g., Greenwald & Stiglitz, 1986; Jaffe, Newell, & Stavins, 2005). Researchers have investigated how a lack of information can disrupt traditional economic models under the conditions of information asymmetry, moral hazard, adverse selection, opportunism, and signaling.

In a first step, economics recognized information as a form of input in production. Thus, a value of its own was attached to information and the hypothesis of information as a public good was rejected (cf. Adler, 1996, p. 5; Hoberg, 2018). Since then, researchers in economics and business have explored various phenomena in business related to information: strategies under uncertainty (Kaas, 1990; Wiltbank, Dew, Read, & Sarasvathy, 2006), information asymmetries in market situations (Akerlof, 1970), signaling (e.g., Spence, 1973), screening (e.g., Greenwald & Stiglitz, 1986; Rothschild & Stiglitz, 1976; Stiglitz, 1975). Due to these considerations, economics developed a new research stream, namely behavioral economics.

With this new role of information in economic systems the neoclassical (micro)economic consideration of prices has changed. Prices used to be considered the only decision-relevant information, as they were thought of as the central coordination mechanism of supply and demand (cf. Söllner, 2015, p. 94). This means traditional economists considered price the result of the intersection between supply and demand, which can be influenced by changes in both. In contrast, business research, and especially pricing research, considers prices a variable that can be actively influenced by companies, with consequential effects in the market.

Starting with this understanding of information as a costly resource, this new perspective spilled over into business research. Subsequently, information behavioral concepts were adopted, which led to new research streams such as the resource-based view, management decision making, heuristics and biases, as well as the effects of information-related phenomena.

Information as a Resource

Since the understanding of information has shifted from that of a public good towards that of a resource, it has gained more and more attention in business research and business practice alike.

According to the resource-based view (RBV) companies can gain competitive advantage in their market due to their specific constellation of resources. In order to make the most of these resources, companies need a non-imitable set of resources and the capabilities to unfold their potential (e.g., Barney, 1991; Cool & Dierickx, 1989; Hamel & Prahalad, 1994; Wernerfelt, 1984). This includes physical and non-physical assets (Estalami et al., 2007). Information is one type of resource that may be used to build competitive advantage (Hunt & Morgan, 1995).

Pricing is known to be influential in determining competitive strategies as well as overall firm performance (Shipley & Jobber, 2001). Dutta et al. (2003) were the first ones to analyze pricing processes under the premises of the resource-based view. According to their research, price-setting processes can be a central capability for sustaining competitive advantage. The distinct characteristics of these price-setting processes are efficient information management and sound reasoning. Major capabilities connected to information as a resource in price setting include the development of relevant information sources as well as the use of these resources (Ingenbleek, 2007b).

The use of resources has been found to depend on the manner of managers' strategic thinking. Sarasvathy (2001) found that managers in entrepreneurial environments (i.e., agile, highly competitive, low amount and flexible use of resources etc.) show a different way of reasoning with regard to resources than do managers in established companies: the two patterns can be described as "effectuation" vs. "causation" (Sarasvathy, 2001). Sarasvathy explains: *"Causation processes take a particular effect as given and focus on selecting between means to create that effect. Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means."*(2001, p. 245). In other words, managers following a causation reasoning are goal-oriented, know the exact outcome they are working towards and strive to collect the necessary resources to achieve this specific outcome. This is in line with planned strategy approaches (e.g., Ansoff, 1988; Brews & Hunt, 1999; Mintzberg, 1978). Managers following effectuation reasoning, on the other hand, assess their current state and potential resources and use this rather fixed status quo to create the best possible outcome. This is comparable to what Mintzberg (1978) describes as emergent strategies and Wiltbank et al. (2006) call non-predictive strategies.

Since Saravathy's publication, causation and effectuation logics have been researched via experimental studies, field studies and quantitative studies that developed measuring scales for the constructs (e.g., Blauth, Mauer, & Brettel, 2014; Brettel, Mauer, Engelen,

& Küpper, 2012; Chandler, DeTienne, McKelvie, & Mumford, 2011; Wiltbank, Read, Dew, & Sarasvathy, 2009). Although the described patterns seem to be incompatible, both types of reasoning are "integral parts of human reasoning that occur simultaneously, overlapping and intertwining over different contexts of decisions and actions" (Sarasvathy, 2001, p. 245). This means that managers might follow either of the two logics depending on the specific situation. Sarasvathy further argues that our economies and their development are moving ever faster, which will lead to a shift of most companies to operating in environments that show entrepreneurial characteristics.

In summary, this means that even in established companies business units may act under effectuation-driven logics if the specific situations qualify to do so. Managers can adapt their manner of reasoning to environmental influences and follow either causation (goal-oriented) or effectuation (resource-oriented) reasoning in a specific situation.

In this thesis, it will be argued that pricing units may be confronted with either situation and therefore both logics can be found. Pricing units may operate within a strong company history and culture and can experience strong interest in pricing by the top management. Yet pricing units can also be working in environments favorable to effectuation reasoning, in that they are established within the company as a separate function, often with the task to restructure processes. This alone puts them in a position of a mediator between other company functions and therefore can lead to strongly resource-based thinking. Furthermore, prices can strongly depend on competitors' movements and pricing units may find themselves in situations of strong pressure (timewise/financially/competitive) – characteristics usually found in entrepreneurial environments.

Within the field of pricing, several publications have adopted this resource-based perspective, which was first proposed by Dutta et al. (2003). Besides the research on pricing capabilities, their antecedents, and their effects on performance measures (e.g., Glaser, 2021; Johansson et al., 2015; Liozu, 2016; Liozu & Hinterhuber, 2013b, 2014; Schmutz, Reinecke, & Manole, 2020), information-related phenomena were also investigated in several publications: Based on a structured literature review, Ingenbleek (2007b) proposed that information sources (such as market research, relationships, internal knowledge) are a valuable resource for pricing teams. The author cautions, however, that developing such resources is not an end in itself; rather, pricing managers have to secure the process of information deployment. More recently, Rusetski (2014) focused on intuition in pricing and the role of uncertainty. Achterberg et al. (2018) researched external pricing antecedents in small and medium-sized enterprises (SMEs) in light of the fact, that "ignoring the informational prerequisites of pricing decisions might jeopardize the firm's existence" (p. 886). In this publication Achterberg and colleagues called pricing information a "crucial prerequisite of successful pricing strategies" (p. 896) and defined pricing information acquisition as "a strategic pricing capability" (p. 897). Shortly afterwards, Feurer et al. (2019) juxtaposed rationality and intuition in the

information processing of pricing units. They found that these two "information-processing modes" significantly influence pricing strategy effectiveness.

This thesis ties in with these research streams and further addresses information processes within the pricing process. More precisely, it investigates pricing managers' information behavior within the price-setting process in the face of pressing information needs.

4.5. Findings from the Literature Review: The Intersection of Pricing, Strategic Management and Information Science

"[...] some important aspects of economic organization take on a new meaning when they are considered from the viewpoint of the search for information." (Stigler, 1961, p. 213)

Pricing has undergone major developments in research and many new perspectives have been added in the last decades. Thus, pricing is not just considered the result of economic market mechanisms anymore, but is increasingly seen as a capability in its own right. This perspective opens the door to investigating price management practices, related routines, configurations, and their effects on firm performance.

Finding 1: Price setting is a capability of a company that can sustain long-term competitive advantage.

In the literature, price-setting processes are described as comprising four phases. The first one, price analysis, aims to analyze competition, cost and market data in order to prepare the information basis for price decisions. It is important to note that the decisions regarding pricing strategy (e.g., penetration or skimming strategies) and the pricing method (e.g., cost-based or value-based pricing) are not made at this stage. Rather, this stage focuses on the information needed to make the final price decision. Yet so far, price decisions have been addressed in the literature without specifically investigating preparational stages, such as price analysis. While the literature review has shown that pricing research often hints at the importance of information processes, the specific case of PRIDs still lacks academic attention.

Finding 2: From the perspective of a manager, price analysis comprises sub-processes which make price setting more granular than described in established pricing process models. Therefore, deviations from normative price-setting processes are very likely, if not necessary.

The occurrence of sub-processes hints at the fact that information processes are not yet incorporated in price-setting models. One specific challenge within pricing processes that normative models so far do not account for is the unavailability of price-relevant information. The relevant pieces of information are not as readily available as these

processes assume. Especially in B2B markets, price analysis encounters serious problems due to information deficits or asymmetries. In this thesis, information problems are defined as the result of unsatisfied information needs, or, in the words of Rajala (2019), "information expectation gaps". The synthesis of knowledge in the pricing and information research literature suggests that information seeking within price analysis interrupts the pricing process and triggers at least one if not several deviations (Fig. 6).

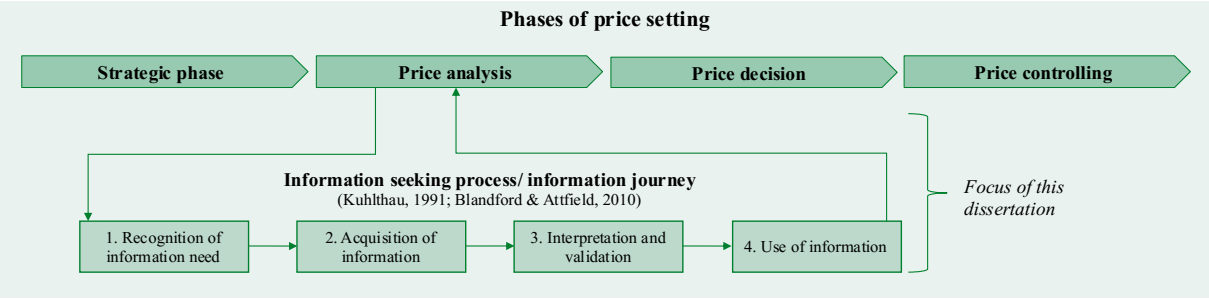


Fig. 6: Information journeys within price analysis

Furthermore, in the understanding of information science, information needs, expectations, processing, and sensemaking all have a strong individual dimension. The individual skills, prior experiences, mindsets, and beliefs of information stakeholders shape the usability and value of information. In pricing research, however, the dimension of individuals' contribution to price setting (the micro-foundations of pricing) is still in its infancy. Therefore, at the time of writing this thesis only very few scientific inquiries on the information behavior of managers in pricing can be found – and even fewer on individuals' contributions to price analysis.

Finding 3: The individual level is crucial in understanding information behavior – and therefore price analysis. Findings with regard to these micro-foundations will build the ground for a better understanding of the current pricing reality as well as the effects of individuals on pricing decisions, price performance, corporate profitability, and other performance measures.

In addition to information science, studies on management decision making form a relevant research stream for the investigations pursued in this thesis. As elaborated above, normative pricing models build on classical management processes. Yet, within the RBV of the firm, price setting is considered a capability that orchestrates resources (i.e. information) with the goal of creating a competitive advantage. With regard to information as a resource, pricing managers can follow the minimum or the maximum economic principle – or, as a third option, disengage from pre-defined goals. Sarasvathy calls these different logics in strategic decision making causation and effectuation. In

her research she describes resource-oriented and goal-oriented strategies in management decision making.

Finding 4: Managers may use more than one mode of reasoning when making decisions and conducting information analyses.

The research of this thesis is at the intersection of all these research streams: On the one hand, pricing practices strongly differ from scientific pricing models. Partly, the results of this divergence have started to gain attention in research, which manifests in investigations of heuristics and information processing. On the other hand, information science has defined information journeys and found related behavior of people in general. The field of management decision making has used some of these findings to define information as an economic resource and to describe managers as subject to individual information processing. Intertwining these research disciplines and making use of findings from all three of them, this thesis aims to fill the gap in the present literature regarding information-seeking behavior in price analysis. Specifically, the reactions of managers in the face of information problems and uncertainty, as well as the resulting use of heuristics are not represented in current pricing models and will be at the core of this thesis. Therefore, the following investigations will contribute to understanding, categorizing, and ultimately enhancing pricing managers' information behavior in real-world pricing processes.

5. Creating a Valuable Source of Expertise in Pricing: The Pricing Panel

"... organizations search for and evaluate information in order to make important decisions. In theory, this choice is to be made rationally, based upon complete information [...] . In practice, rational choice-making is muddled by the jostling of interests among organizational stakeholders, bargaining and negotiation between powerful groups and individuals, the limitations and idiosyncrasies of personal choice making, the lack of information, and so on." (Choo, 1996, p. 329)

Limited access to pricing managers as well as the professional discretion pricing people are bound to are major challenges for conducting empirical pricing research (cf. Carricano et al., 2010, p. 470; Lancioni et al., 2005, p. 125; Liozu & Hinterhuber, 2014, p. 148; Wood, Watson, & Teller, 2021, p. 6). Yet the research endeavor of this thesis strongly depends on insights into pricing processes, organizational structures, and price-setting tasks of pricing units. Therefore, a crucial step in overcoming these obstacles was the creation of "the Pricing Panel": a circle of pricing people who came together as focus groups to discuss current research topics, study the results of this thesis' projects, and act as a gatekeeper for the relevancy of this thesis' research.

The Pricing Panel consists of over ten persons from industrial companies, who are active in international markets, and have a say in pricing matters of their companies. This means they have detailed knowledge of their companies' pricing processes and actively participate in more than one process stage. They were all recruited by the author through intensive networking within the pricing community. This included recruiting via professional social media (such as LinkedIn) and by snowball sampling. The participants were incentivized only by the exclusive and pre-publication presentations of research results.

In total, this panel was invited to three surveys, two focus groups, and at least two individual interviews per participant. In sum, they received three executive summaries over the time span of four years (2018–2021).

Several characteristics of the Pricing Panel were beneficial to the present thesis:

- The Pricing Panel offers a trustworthy environment and a platform in which pricing managers from different industries can exchange opinions on current research topics and state-of-the-art practices.
- By repeatedly interviewing each participant, the author was able to establish professional relationships with the participants. This increased their willingness to share, which, especially in pricing, is necessary to generate reliable and valuable insights. Due to the managers' long-term engagement the panel allowed for a unique understanding of their specific cases. This in-depth case knowledge made

the envisaged research designs fruitful and ensured the (internal) validity of the generated insights.
- The network created in this way was a useful multiplier for the collection of quantitative datasets.
- The growing sensibility for PRIDs within the panel enabled the participants to identify and separate PRID-related matters in pricing from other issues, which further increased the value of the shared information.

Due to the combination of these benefits, along with the engagement over four years, the Pricing Panel turned into a unique and precious source of data collection and provided in-depth insights into company structures, processes, and measures. In the following chapters, Whenever the Pricing Panel will be mentioned explicitly whenever it was involved in the respective study.

6. The Reality of B2B Price Analysis – Uncertainty, Information Deficits, Missing Values, and Interruptions

„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." (Iyer et al., 2015)

As established by means of the literature review (cf. chap. 4), B2B pricing practices and their empirical analysis have received little attention in scientific publications. This chapter shall address the research gap of information processes in price setting starting with an explorative investigation of pricing practices to gain a cumulative understanding (e.g., Ingenbleek, 2007a; Kienzler & Kowalkowski, 2017; Reid & Plank, 2000). First of all, real-world price analysis and the corresponding triggers for deviations from planned or normative processes are investigated. In a further step, these deviations and their characteristics are identified. Thus, this study aims to answer the following questions:

RQ3: When and under which conditions do pricing managers deviate from normative or planned pricing processes?

RQ4: How do pricing managers compensate for the deviation from normative or planned pricing processes?

RQ5: Where do pricing managers redirect their focus when deviating from normative or planned pricing processes?

By observing information behavior from a management journey perspective (Schmutz & Reinecke, 2019) this study adds to current price-setting process models as it allows for the identification of obstacles, triggers, and deviations from said processes. The findings on price relevant information analysis will be summarized in the "Price Relevance Model".

6.1. Research Design and Methodology

In B2B markets, researchers usually approach data collection by using survey designs (Kienzler & Kowalkowski, 2017). However, with regard to the research objective of exploring pricing practices, survey designs can have several shortcomings: limitations to the richness of transmitted information, self-reporting bias and reluctance to share insights.

Qualitative research of pricing, on the other hand, allows researchers "to gain first-hand, in-depth understanding of the intricate, context-specific processes of pricing strategy development" (Kienzler & Kowalkowski, 2017, p. 109). Yet, researchers usually encounter many obstacles when trying to gain access to pricing managers (as discussed in chap. 5), which is why studies with qualitative datasets are not as frequent in pricing research as they are in other disciplines. This chapter presents a two-step qualitative study design which sheds light on the management journey in price setting. It consists of an explorative part, followed by a confirmative part.

The Management Journey

This study uses a journey model approach to price setting (Schmutz & Reinecke, 2019). This perspective helps to trace managers in their price analyses and especially in their deviations from pre-defined processes. Journey modelling has also been used in other areas of research: e.g., travel decisions (e.g., Beritelli, Reinhold, & Luo, 2019), customer journey analysis (e.g., Bitner, Ostrom, & Morgan, 2008; Lemon & Verhoef, 2016), or information journey modelling (e.g., Du, 2014; Pontis et al., 2017). Following these applications, this study understands the price-setting process as a „management journey" (Schmutz & Reinecke, 2019) and portrays it as such.

Following this approach implies that this thesis does not scrutinize the representations of normative pricing processes, but complements them by deepening the understanding of the various stages. Several characteristics of B2B pricing are captured best through the application of a journey approach:

- **B2B pricing is interdisciplinary**: It encompasses information analysis, coordination and information management, resource strategy. The combination and the specifics of these interdisciplinary tasks are situational. Thus, a realistic understanding of management practices in B2B pricing can only be derived from the managers' perspective as a theory-driven approach is not able to capture the complexity.
- **Stages and touchpoints**: Price-setting processes vary strongly with regard to the stages and their chronological order as well as with regard to the nature and frequency of touchpoints with other business units and external parties. Following these stages and touchpoints from the managers' perspective is inspired by the customer journey analysis, which describes the "process a customer goes through, across all stages and touch points, that makes up the customer experience" (Lemon & Verhoef, 2016, p. 71). This change in perspective amends normative price setting models, in that it understands the price setting process as a management journey.
- **Two-way coordination**: Pricing units coordinate information sources as well as information users (e.g., decision takers). Therefore, a major task of the pricing

> unit consists of information transmission. This includes searching for, selecting, procuring, evaluating, processing and transferring information where it is needed (Schmidt, 2004).

Capturing the complexity and individuality of price-relevant information analyses can succeed only with a shift of perspective from a companywide meta-level to a price management perspective. In this context, the management journey is not a new representation of the price analysis process but rather a concept of information analysis that includes obstacles, triggers and experiential elements as well as individual solution approaches (following the argumentation of Steward et al., 2019). Management journey analysis will contribute to the research stream of active price management by proposing an analysis tool which will help optimize pricing potential and consequently professionalize pricing (as the customer journey does for customer processing).

Step 1: Explorative Study

The first part of this study consists of an inductive, explorative approach using a qualitative study design: data collection by semi-structured interviews using the critical incident technique following Bott & Tourish (2016), who suggest that "the critical incident allows for a deeper understanding of the intricacies and contextual factors surrounding behaviors" in organzations (Bott & Tourish, 2016, p. 278). The authors advocate that escpecially with the purpose of theory building in management critical incidents provide the necessary in depth data richness. Also in the field of investigations on information behavior, applying the critical incident technique has a long-standing practice (e.g., Chaudhry & Al-Sagheer, 2011; Fidel & Green, 2004). The following data analysis draws on the principles of „Grounded Theory" (Strauss & Corbin, 1990). This method fits the explorative nature of this project and the aim of conceptualizing conditions of and deviations from normative/planned pricing processes. It is used to gain insights into pricing realities, which will then build the basis for answering the research questions (cf. Sebastian, 2019).

The sample consists of 21 semi-structured interviews with persons responsible for B2B pricing across industries (1304 min of audio material). Interviewees describe their price-setting processes with a focus on deviations from planned processes. Interviews were conducted up to the point of theoretical saturation. This means no fundamentally new pieces of information were found in the last transcripts. The information gathered in the last interviews was used to confirm previous findings. The interviews, with an average length of 1:02 h, were conducted mostly in German, as this is the mother tongue of most participants. All of them were transcribed verbatim, coded in several rounds (using ATLAS.ti software), analyzed following the Grounded Theory approach (Gioia, Corley, & Hamilton, 2013; Strauss & Corbin, 1990), and the quotes were translated to English to include them in this thesis.

The interviewees were selected according to the following criteria: The managers should have a position with pricing responsibility/authority in an internationally active B2B company in the industrial/manufacturing sector with a need for product pricing. The products or systems should be standardized and sold to an anonymous market (1:n, where n denotes the number of customers)(Backhaus & Voeth, 2015b, 2015a).

All interviewees were recruited via networking, recommendations and internet research followed by invitation emails with indicative questions attached (see the Appendix B). Participants referred in their interviews to cases within the following companies: ABB Ltd., AMAG Group AG, Robert Bosch GmbH Power Tools, Robert Bosch GmbH Sicherheitssysteme, Continental Reifen Deutschland GmbH, Bühler AG, CRH Swiss Distribution, Dräger Safety AG & Co. KG, Evonik Industries AG, Geberit International AG, Giesecke & Devrient GmbH, Hansgrohe AG, Hilti AG, Hoval AG, Inficon Holding AG, Röhm GmbH, Sulzer AG, Stihl Holding AG & Co. KG, Transgourmet Schweiz AG, TRUMPF GmbH & Co. KG, Vitra-Visplay, V-ZUG AG, Zehnder Group AG. A more detailed description of the participants can be found in Appendix A.

As pricing is a highly sensitive and therefore confidential topic, many companies did not allow their pricing managers to participate in this study. The participants were incentivized only by the privilege to receive an executive summary and participate in an exclusive presentation of the results before publication, as suggested by Jäger and Reinecke (2009, p. 46).

Step 2: Confirmative Study

After several rounds of coding, from in-vivo coding to code reflecting and re-coding (cf. Fig. 7), the results of theory building were presented to a focus group. Five pricing experts from different industries and from academia were invited to participate in a 3-hour workshop at the University of St. Gallen in order to discuss and challenge the results of the exploratory study. The discussions of the focus group were recorded, synthesized, and documented in a workshop report.

Finally, the results of both studies were combined and the findings were refined accordingly.

6.2. Documentation of Data Analysis Procedure - Memos

According to the concept of Grounded Theory, the interviews were initially not focused on price analysis; rather, participants were asked to describe the pricing process of a specific product. The interviews were conducted and coded in an iterative manner (cf. Fig. 7). Three rounds of coding led to an aggregation of dimensions that were then represented in a theoretical model.

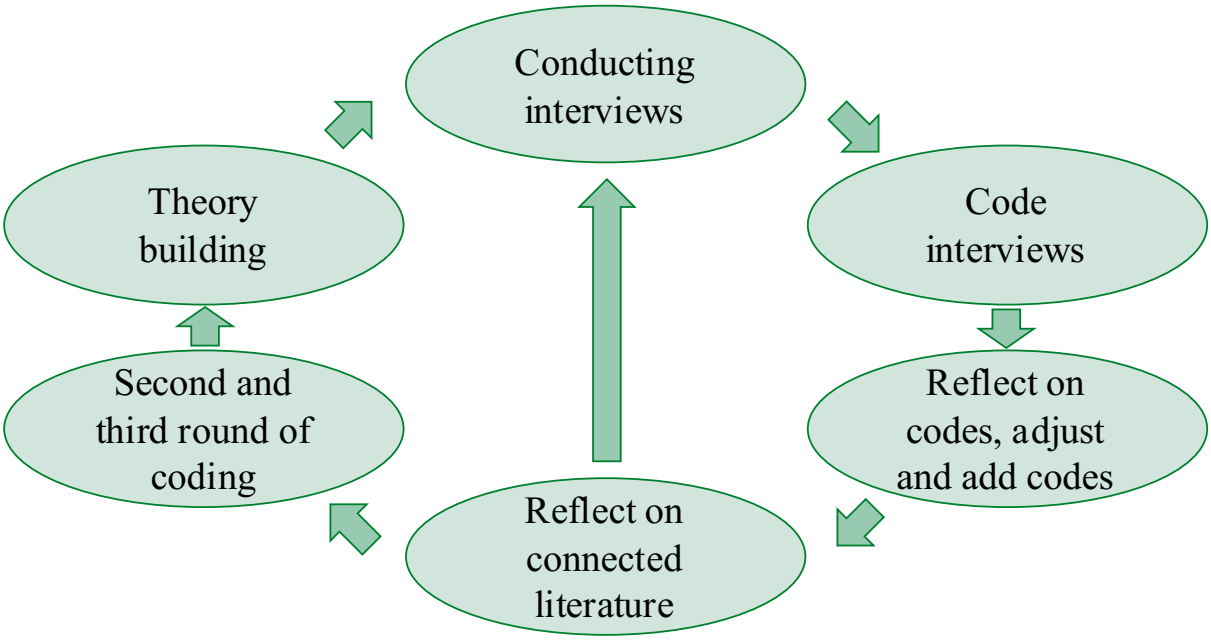


Fig. 7: Data collection and analysis according to Grounded Theory (author's illustration based on Gioia, Corley, & Hamilton, 2013; Strauss & Corbin, 1990).

Throughout the first round the interviews were subject to open coding in order to find out how pricing processes are conducted in practice and to determine deviations from price process models. The participants reported many challenges within the pricing process, and missing information during price analysis were identified as one of the main challenges. Missing information is completely in the pricing managers' authority while the responsibility for challenges in other stages of the price-setting process (strategy, decision and controlling) is in most cases shared with one or more other business units (in line with Rusetski, 2014, p. 1741). For example, the pricing managers mostly prepare a price decision, but the decision itself is usually made in cooperation with other BUs or by a specific council, e.g., of c-level managers (CMO, CSO, CCO etc.). The composition of the price decision council varies with the importance of the product that has to be priced. Therefore, the focus of this study is on price-relevant information deficits (PRIDs) in price analysis, which are fully within the participants' authority.

In the second round of coding the specific PRIDs were selected, in combination with reasons for their occurrence and managers' reactions to them. This resulted in a list of concepts and higher-order categories. In the third round of coding these codes were combined to aggregated dimensions, which then led to the model building resulting in the Price Relevance Model. Fig. 8 summarizes the code development over all three rounds.

The following subchapters present and discuss the findings of the three coding rounds. The specific outputs directly from the Atlas.ti Software can be found in the Appendix (C-F).

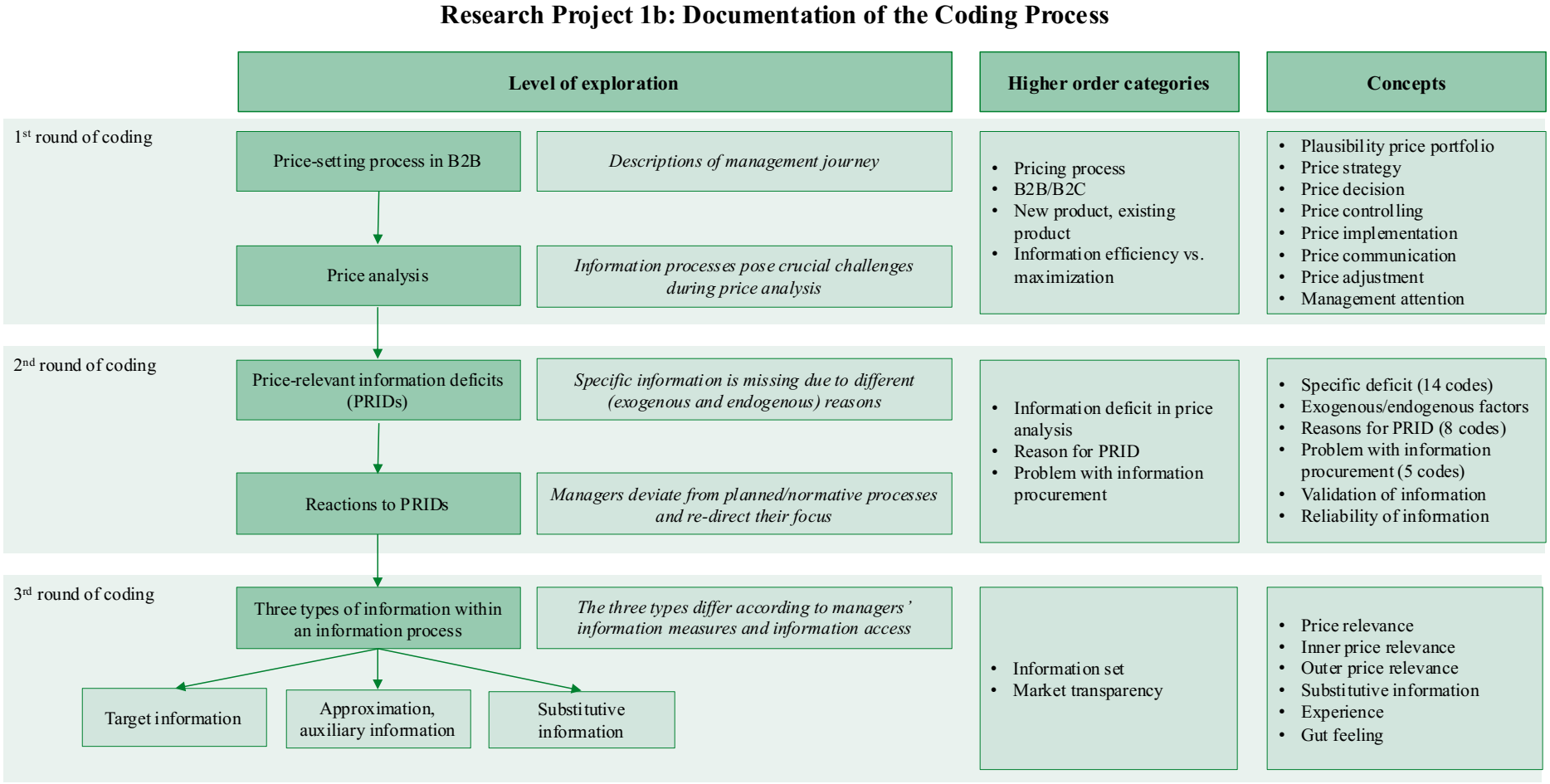


Fig. 8: Documentation of the coding process

6.3. Information Deficits Trigger Deviations

Missing pieces of information force managers to deviate from normative or planned processes in price setting. Several steps of the price-setting process are not as trivial as some of the models suggest. In other words, interruptions of normative price-setting processes are caused by the detection of a (price-relevant) information need (cf. Fig. 4 in literature review). Managers in this sample report about experiencing a certain pressure to act and a strong time pressure throughout their pricing tasks. When the request for pricing a product arrives in their unit, the product is often ready to enter the market and "only needs a price tag". Yet, information from finance, development and production comes in late and other information acquisition measures are time-consuming and costly. During the coding process 14 information deficits were identified in the interviews (e.g., development and production costs, customers' willingness to pay, delivery costs, previous pricing logics, risk factors, rebate structures, competition prices and many more). These constraints are in line with prior research findings (e.g., Rusetski, 2014). They increase the effects of PRIDs and require managers to cope with the information deficit. Hence, temporarily missing information or data of inferior quality can act as triggers for process deviations.

The causes for information deficits are manifold and may be categorized into exogenous and endogenous factors. Exogenous factors cannot be directly influenced by the pricing manager or the company. They include legal or methodological restrictions, such as competition laws restricting the exchange of net price information between companies. Endogenous factors, on the other hand, are of a structural, processual and/or personal origin, i.e. are caused by problems in information or coordination processes (cf. Totzek & Alavi, 2010a). Thus, endogenous factors are under the direct influence of the pricing manager or the company. They comprise knowledge management, information processing between business units, incentives for sharing (or withholding) information, e.g., the unstructured collection of price-relevant information from customers through the corporate sales personnel. Table 3 juxtaposes endogenous and exogenous factors and illustrates them with quotes from the dataset (translated from German).

	Exogenous Factors	**Endogenous Factors**
Description	Exogenous factors which cause a PRID, are external with respect to a company and can therefore not be influenced directly. They include legal or methodological restrictions as well as insecurities due to estimations of future developments.	Endogenous factors which cause a PRID are of a structural, processual and/or personal origin and can therefore be influenced directly. They include internal knowledge management, information flows among business units (e.g., Sales and Marketing), selective disclosure of favorable information and closure of hindering information.
Examples from the dataset	Competition regulations prevent agreements between companies with regard to many factors, including prices. This hinders companies to openly communicate price-relevant information. Realized prices are significantly different from net list prices due to (individual) rebates, boni, and negotiations. Actual prices of competitors are therefore not attainable, often not even the own realized prices are documented.	*Implicit knowledge of sales personnel which is not documented or only documented in an unstructured manner. The interviewees mentioned the following aspects:* • *time pressure* • *no adequate documentation tools (e.g., within CRM)* • *varying/ conflicting priorities, incentives* • *company culture (e.g., not accepting pricing as an important role)* • *underestimation of the need to and the potential of collaborate with pricing*
Power Quotes	• *„Thank God cartel law forbids the acquisition of such information in shady backroom deals. This is the way it has to be and we strictly adhere to this law. But, of course, this poses a major information insecurity.“ (Stefan_2)* • *“… because we are in B2B and due to legal reasons we are not allowed to request net prices. This is forbidden as this information is not publicly available. We are allowed to request list prices. But even in this regard we have to ask an*	• *„At the moment one of our biggest problems is data quality in our own stems, the ones we consider when preparing a price decision. In the future we want to create more awareness in our company for the consequences if someone, for example, actually types 1 kg instead of 1 g in the field for weight.” (Thomas)* • *„Then we experience increased time pressure from customers, because they want the prices earlier than usually,*

	external entity to do so, otherwise collusion could be implied." (Matthias) • *"Often there are […] selective embargos which are valid for specific product groups." (Jürgen)*	*because they have to incorporate [prices] in their own complex systems." (Stefan)*
Consequence	Predictable information deficits: Solutions must be more elaborate but can be prepared in advance.	Information deficits might be predictable or appear ad hoc: Coordination processes (knowledge of information need, sending and receiving the right information at the right time) and information processes (gathering and preparing information in time) within the company.

Table 3: Juxtaposition of exogenous and endogenous factors causing PRIDs

This provides initial insights regarding the answer to RQ3. Exogenous factors remain the same for each new pricing process. Hence, pricing managers can anticipate the PRID and develop measures that help them bridge these deficits, especially in the long term. In contrast, endogenous factors may differ in different pricing processes and can occur spontaneously or even unexpectedly. Bridging such information deficits requires ad-hoc reactions. Nevertheless, once an exogenous or endogenous factor has caused a PRID, managers have to react to these information problems as they are, by definition, crucial to the price decision. How managers react and where they redirect their focus is the second part of the research question and will be the topic of the following subchapter.

6.4. Reactions to PRIDs: The Price Relevance Model

Information procurement is a crucial part of price analysis and essential for price setting. Therefore, information needs cannot be left unanswered. This means pricing units have to find a way to bridge price-relevant information deficits and redirect their focus to approximations or substitutes. The coded items from the present study that describe such behavior enter into the Price Relevance Model (Fig. 9, Fig. 10).

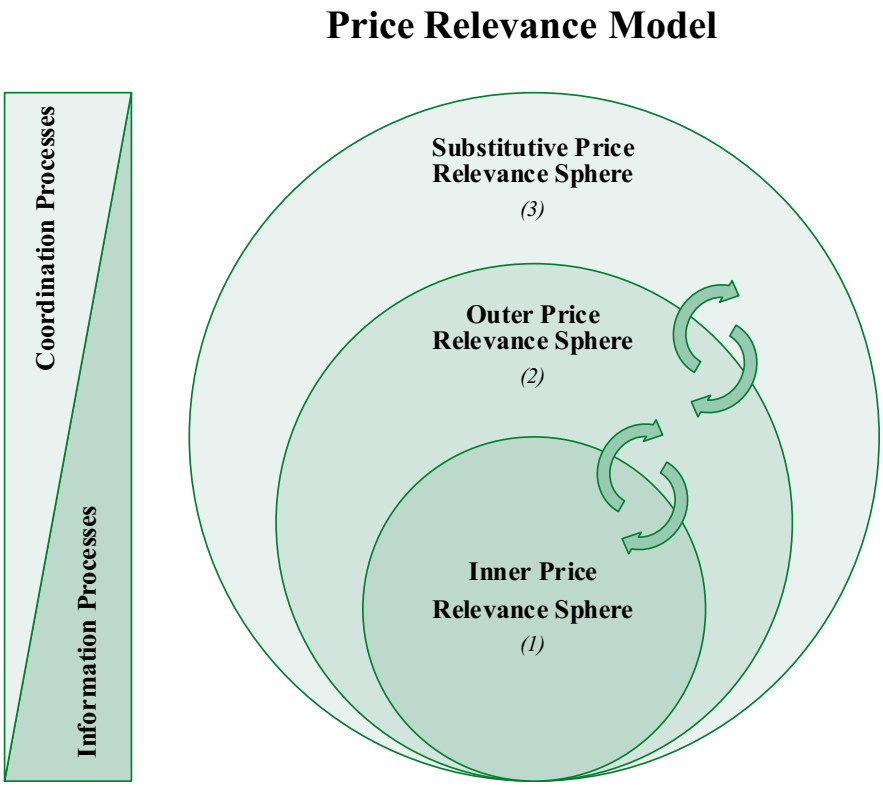


Fig. 9: Price Relevance Model: information environment in price-setting processes (based on Schmutz & Reinecke 2020)

The Price Relevance Model categorizes price-relevant information into three spheres. The *inner price relevance sphere* contains concrete and reliable information, which pricing managers seek for at first. If an information need can be satiated here, the information need never turns into an information problem and the information seeking process can be terminated. Yet, according to the data analysis of the present study the far more frequent case is the detection of an information deficit at this point:

"Generally dark spots always remain. You know, there are always pieces of information that one does not have. We always decide under a condition of incomplete information. You never exactly know about the market shares of competitors or volumina, how they sell or whatever constellation is of interest to you at a certain point in time. […] In this case we are relatively pragmatic." (Frank)

When a PRID is detected within this sphere, the search for compensational information is triggered. This means managers redirect their focus to the next two price relevance spheres. The *outer price relevance sphere* contains approximations, proxy variables and auxiliary (complementary and alternative) information. Pieces of information in the outer price relevance sphere allow pricing managers to approach the original information. For example, competitors' prices may be approached by mathematical models estimating competitors' costs. In combination with assumed margins, these models result in approximations of competitors' prices.

"This is only a rough indication, as in the end I do not know which discounts the competitors offer to key accounts. Actually, if one is in the [same] business, one can roughly calculate margins. If I look at [a certain product] today, I can tell you how much it costs in net purchase prices, because I usually know where the goods come from. […] one can then approximate and estimate a margin." (Christian)

„We know the approximate price structure of our competitors, because the costs for raw materials are the same for everyone. When someone produces in country X or Y, we can estimate production costs and thereby know approximately what their minimum price will be. Then we estimate their level of capacity and to which degree they would waive margins in order to win the mandate." (Jürgen)

„There is a huge number of data sources […] we are not only looking backwards but also forward. Which statistical data do we have from which we could calculate future developments? Which qualitative assessments do we have that could indicate what our competitors will do? We look at the market share developments. From there we can use statistical modelling in order to identify trends, and in combination with our internal data we can then estimate which segments would be worth targeting." (Till)

If the search for relevant information is still not satisfactory, pricing managers draw on the third sphere, i.e. the *substitutive price relevance sphere*. Information in this sphere may serve as a substitute for the original information, but it lacks reliability and precision. This includes experts' estimations, managers' gut feelings, inklings and market hearsay. The inclusion of intuition and gut feelings, along with deliberate information processing, in one and the same model was proposed by Savolainen (2017). Confirming this research, the present study found that intuition and gut feelings are used as supportive modes in price-relevant information processing. In line with previous studies, managers frequently rely on their gut feelings and their experience to make decisions and develop heuristics (Mousavi & Gigerenzer, 2014).

„Of course, no confidential information but only hints and recommendations are expressed there. Obviously, they are nowhere near binding. Even with a positive recommendation – if things turn out differently, we cannot invoke this [recommendation]." (Jürgen)

„… by now there are factors in calculations which carry the name of the people who introduced them and who simply had a certain pool of experience. […] The most reliable pieces of information have usually been the ones based on experience in price setting." (Oliver)

This kind of information reduces uncertainty only by a small amount but is often perceived and treated as reliable. Using information from this substitutive price relevance sphere successfully can provide a competitive advantage. However, this information can also distort the picture if the perceived certainty is overvalued. Pricing managers have to correctly estimate the weight of this information within the specific information environment and develop a strategy to verify and cross-validate it. Otherwise, such estimates of factors can lead to "illusory certainty" (Mousavi & Gigerenzer, 2014, p. 1671) as described by means of the example of perceived financial stability in an economic system by Shefrin (2017).

"I always say: 'Guys, if you receive price information on competitors, make sure you have three different sources before you use it.' […] [And if I ask:] Where did you get this price from?' and they say: 'Well, the buyer said so.', my answer is: 'And do you have other buyers who say the same or other people who maybe are not buyers?' Them: 'No, we don't.' […] We cannot work with this, because we all know, if we are honest with each other, he will not give you the true information. We have gone through this process repeatedly because I almost obsessively insist on this: 'I need three independent sources in order to be able to use the information for calculations.'" (Gerry)

„We validate all data sources. This means not every statement is immediately processed further. For example, we receive numbers on our stock level, but the statement is not

signed by a controller. This means the numbers are half quantitative and half qualitative. […] The path of validation depends on whether the data is quantitative or qualitative. The more qualitative, the more we need to validate. […] We only process information about competitors and inventory after we have completed this validation process. If there is only one piece of information, then this is a first indication but it's not the basis for decision-making in the following processes." (Till)

Thus, the substitutive price relevance sphere holds the biggest professionalization potential in terms of coordination processes across business units and within the specific markets (Dutta et al., 2003; Farley et al., 1971; Shipley & Jobber, 2001), while the importance of information processes increases towards the inner price relevance sphere. Aggregated, the various pieces of information in the different spheres of the Price Relevance Model constitute the information set for pricing decisions.

Pricing managers usually respond to information deficits (detected in the inner price relevance sphere) with compensatory measures: they redirect their focus from the originally needed information to (a set of) approximations or the next best substitute. In Fig. 9 this redirection of focus on the other price relevance spheres is represented by the arrows pointing outwards. Thus, they represent one part of the price management journey. The arrows pointing inwards represent the goal of transferring pieces of information via the validation processes mentioned above towards the inner price relevance sphere.

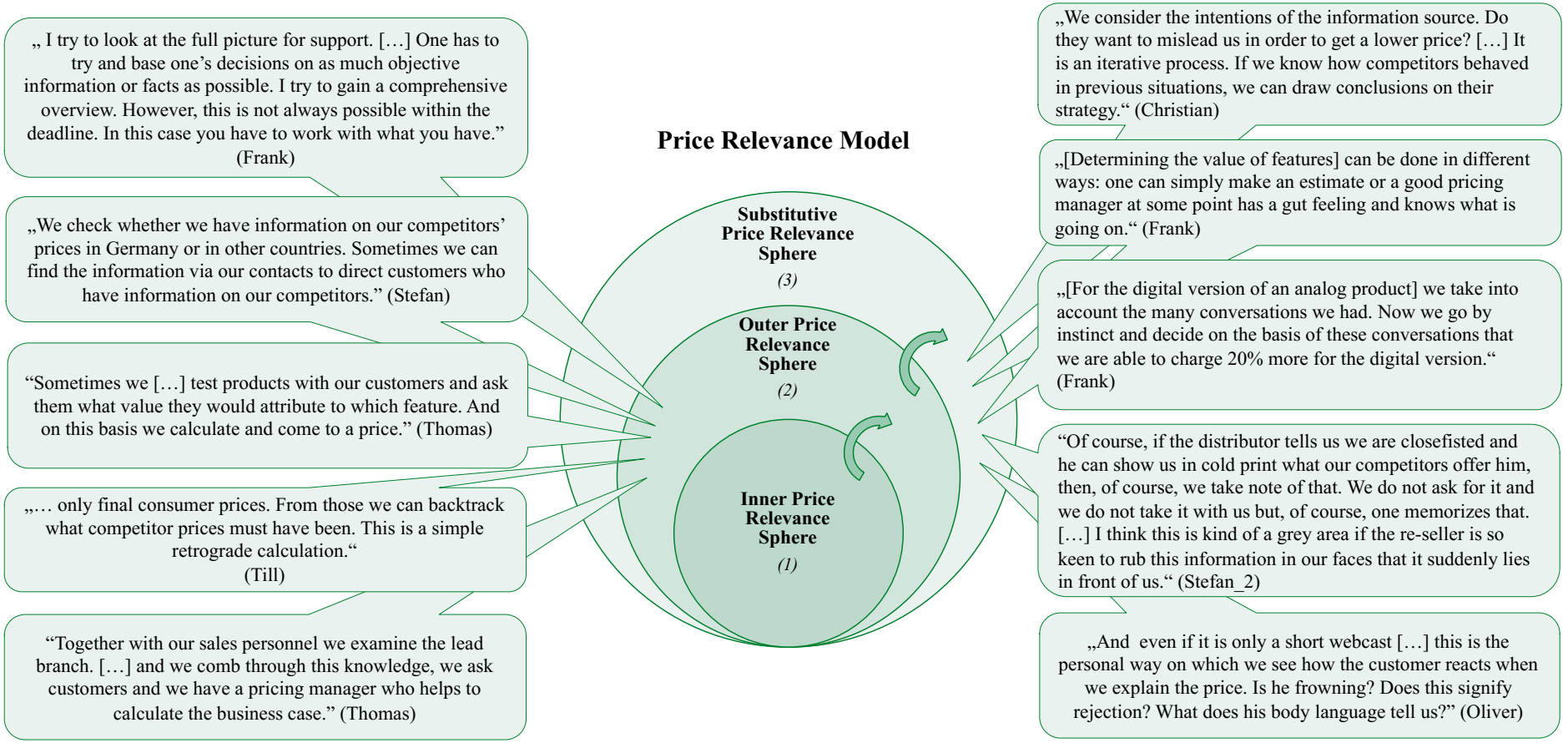


Fig. 10: The Price Relevance Model: exemplary quotes

6.5. Exemplary Cases Illustrating the Price Relevance Model

This subchapter illustrates the Price Relevance Model with specific cases from the data set. Firstly, the most frequent PRID, namely information on competitors' prices, serves as an example of price relevance spheres and of how managers react to PRIDs. Secondly, the case of one specific company from the dataset sheds light on how the process of verification and cross-validation can be conducted in practice.

Information Behavior: Competitors' Prices Usually Constitute Information Problems

In order to offer marketable prices, competitors' prices are generally considered a relevant benchmark (Krämer & Schmutz, 2020; Ohmae, 1983; Totzek & Alavi, 2010b). In B2B markets competitors' prices are usually unknown because price lists are protected by cartel and competition regulations and net price lists are distorted by company-specific rebate systems. In the data analysis of the present study more than 90 text passages were coded as directly related to this specific PRID.

"The comparison is important. Where do we stand in relation to our competitors? This is the most important thing. […] Of course, we have customers and re-sellers who receive price offers by multiple suppliers. Theoretically, we could find out the prices with more or less time delay. […] But we are not allowed to use them. This is simply forbidden. Therefore, we have to keep our eyes and ears open on the market – hear and note what we can pick up." (Stefan)

Since every company would like to have information on their competitors' pricing tactics before setting their own prices, this PRID usually turns into an information problem. Whenever this PRID comes up in the inner price relevance sphere, managers react with a deviation to the outer price relevance sphere as information on competitors' prices is crucial. Thus, pricing managers use alternative information such as the positioning of competitors and/or price estimations based on assumed margins.

"Generally, one cannot really monitor the competition. [Our company] is extremely cautious regarding the issue of compliance. Therefore, one can essentially only make estimations. Other than that, of course, we use everything else we can find – be it price publications on the internet, in web stores or anything else regarding hardware or individual products. But otherwise, the topic of monitoring is limited to what would be available to the normal consumer on the internet. Of course, there are also exchanges on the association or committee level, where they provide individual assessments which are then anonymized and generalized by the associations and made available publicly. Such sources also exist, of course, but they do not permit any direct pricing derivation, but rather only represent very rough directions that may serve as an aid." (Oliver)

In addition to these approximations some managers will also draw on substitutive information: for example, tacit knowledge of sales personnel or second-tier information from customer visits (cf. Shipley & Jobber, 2001). Information gained from customers is often introduced by sentences like "*You are far more expensive than your competitors*" or "*If you match the competitor's offer we will buy from you*". Pieces of information in the substitutive price relevance sphere hold valuable competition and customer knowledge – theoretically they can substitute for the original information on competitors' prices. However, these pieces of information pose two problems:

1. The information is contextual and transitory. The information was transmitted in the context of a (price) negotiation and used as an argument (Campbell & Kirmani, 2000). Due to this specific intention, the reliability and preciseness of the information is debatable. Moreover, the information procurement by sales personnel is selective (Reuters, 1994): Information that leads to strong pressure on them is considered more important and transmitted more frequently and with emphasis. Therefore, managers operating with information from this sphere have to consider the context in which this information was generated and transmitted. The more experienced managers are and the larger their networks, the more are they able to derive valuable information from the outer price relevance sphere and use it as a substitute.
2. Price-relevant information is highly time-sensitive. The second-tier information transmission requires additional and distinctively more time than other forms of information procurement. Therefore, these pieces of information may be obsolete by the time of application. Similar problems can occur with other pieces of information, which leads to a lower level of reliability (Shipley & Jobber, 2001).

As some of the previously presented quotes also show, the consulted managers advise to rely on this kind of information for a primary overview and feeling for the market situation – its value unfolds only in combination with other alternative/substitutive variables. Solutions presented by participants of the present study range from three cross-validations of competition price information by sales personnel to the reproduction of prices using the company's own margin and cost data. One case which shows explicit and strict validation processes is presented in the following subchapter. Further examples of how the Price Relevance Model represents pricing realities in B2B price setting can be found in Fig. 11.

The Dynamics of the Price Relevance Model: Validation of the Information

Information from the substitutive price relevance sphere is imprecise and can either lead to a preliminary assessment of the pricing situation at hand or be completely misleading (and wrongly induce pricing managers to reduce prices). Therefore, several publications advise to use this kind of information with caution and only in restricted cases or

situations (cf. Achterberg et al., 2018; Bogomolova et al., 2017; Rusetski, 2014). Another way in which managers in this dataset use these pieces of information is in a (structured) validation process. This subchapter gives an example of the validation process used by an international automotive supplier.

The information situation of this company is advantageous in comparison to companies from other business fields in this sample. The market is quite transparent and offers many useful information sources for the pricing team. Additionally, the data silos within the company are mostly permeable and information flows from other BUs are constantly active.

The pricing managers reported in the interview that they usually have the following pieces of information at their disposal: qualitative and quantitative information from customer negotiations, reports from industry associations, data from an external but shared data pool on the market share allocation, internal financial data, market statistics on existing and new vehicle registrations, macroeconomic data, information on trends provided by customers, and final sales prices from online platforms collected in a long-term databank.

"We have named a lot of data sources. But what I would like to show is that we do not only look back, we also take a look into the future. What statistical data do we have to calculate future developments? Which qualitative perceptions about competitors' tactics do we have? So, again, quantitative and qualitative [data]." (Till)

The pricing managers are aware that these pieces of information come with different degrees of reliability. Yet they leave the final assessment of valid information sources to the price decision takers. This is the crucial moment in the transition from price analysis to the stage of price decision taking. The way in which information needs are answered by the pricing managers and information problems are solved has a crucial impact on the price decision. Are information sets presented as found? How is the information processed? And to which degree is the information analysis transparent and understandable to decision takers? The transition from price analysis to price decision taking demonstrates whether information problems have been defined correctly, whether objective and subjective information needs were communicated transparently, and lastly, whether the managers were able to derive competitive advantage from their ways of bridging PRIDs.

The company presented here transmits data sources and emphasizes transparency for the decision takers. Of course, having a rich information basis probably encourages openness in price analysis practices. Pricing managers with sparse information access and difficulties in information procurement are more likely to feel the need to "sell" their information to decision takers. Moreover, the degree to which pricing managers

can provide data sources to decision takers highly depends on the information processes and documentation within the company.

"One example: Everyone knows that one cannot talk to competitors. This means we are allowed to use only the pieces of competitor information that we have gained from our customers during negotiations, i.e. information that customers shared voluntarily. We are not allowed to visit all of them and ask: Can you give us the prices competitor X is charging? […] In terms of documentation this means that we have to ensure that from the moment a piece of information enters our company it is documented: Who has received said information and from whom? […] In this way we can use and consolidate information from customer conversations. But exclusively information that we are allowed to process. This also excludes information that might be hearsay knowledge or gossip in the market. We have to differentiate and ensure that we act cautiously." (Till)

Consequently, documentation of the history of a piece of information is required for data use as well as its validation. Moreover, the interviewees emphasize that pieces of information are never used in an isolated way. Single statements are always put into the context of other, similar information and compared to the information basis gained from other sources.

"We only process a piece of information after we have conducted this validation process. If we have only one single piece of information, this is treated as a first indication, but not as a basis for subsequent processes. […] For this reason, management experience is the key to assess information from customers. […] the result of this validation process is a trend, for example, 2% up or 1% down or whatever. This is the tendency we consider in any further analyses." (Till)

To reach a reliable information basis, pricing managers of this automotive supplier use a structured and standardized information validation process. This is due to two reasons: compliance regulations and the intense competitive situation with high price transparency. The trends resulting from the validation process support their pricing not just in one country but in larger business areas and enable them to harmonize prices across markets.

In summary, the interplay of careful information selection and expert assessments leads to a broad information basis for effective and fast pricing decisions.

Lessons Learned

What pricing managers can learn from the Price Relevance Model and the presented exemplary cases is synthesized in the following list of lessons learned:

- Information analysis is a core capability of pricing teams as it "reduces uncertainty and improves the quality of pricing decisions" (Achterberg et al., 2018, p. 896). Therefore, price analysis should be a central task in pricing and companies should emphasize not only its operative but also its strategic nature.
- Information has different levels of reliability. Information – gained from market, customer, or internal sources – should always be carefully used and cross-validated.
- More information is not always better. Adding unreliable information (e.g., single customer quotes from negotiations) to reliable information sets can distort the picture.
- The information sources must not get lost in transmission. When pricing managers forward their analyses to decision takers, they should make sure that decision makers can form their own opinion on the reliability of the information sources.
- Documentation of the history of single pieces of information is the key for transparency in pricing decisions. This transparent information basis, in combination with management experience, improves companies' ability to adapt to intense competitive situations.
- A transparent information basis helps managers to exploit their pricing capabilities to the fullest and can thus build comparative advantage for their company.

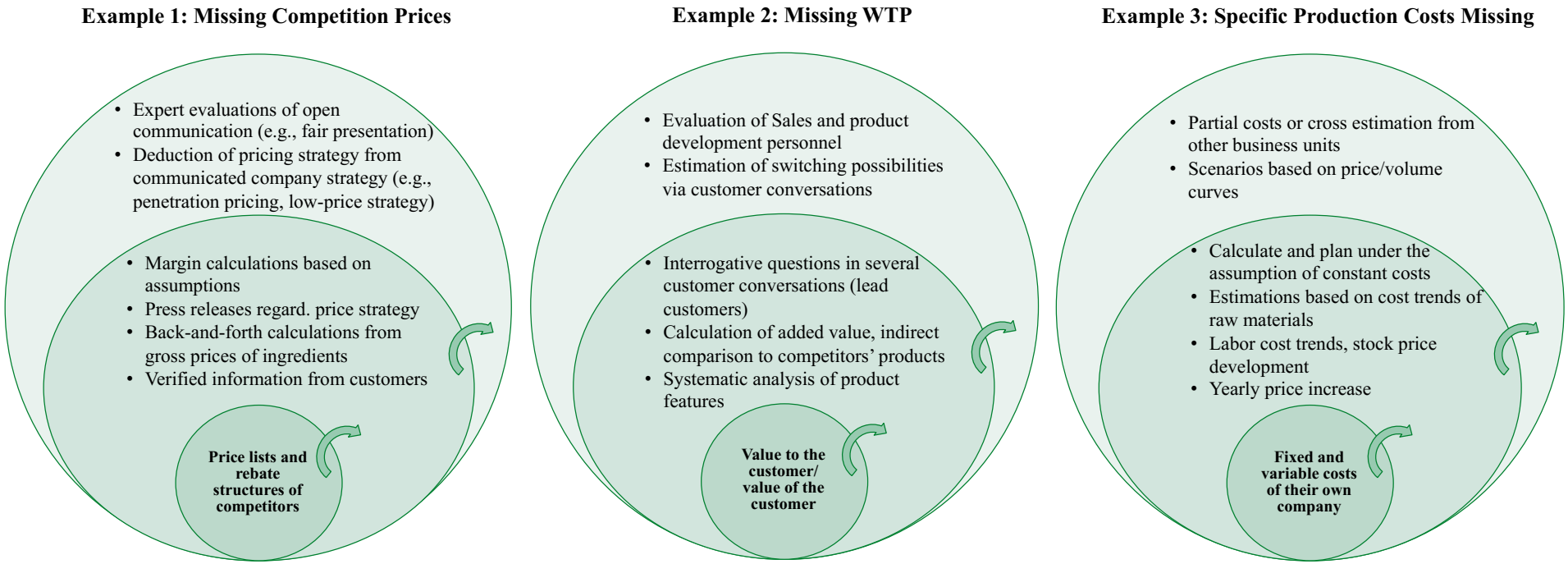


Fig. 11: Three examples of PRIDs and managers' re-direction of focus

6.6. Discussion and Implications

The success of price decisions depends on the information used in decision making. Therefore, companies should aim for the best possible information basis for their pricing decisions. The best possible information basis is considered one that is based on the principle of information efficiency rather than on information maximization[2]. Information efficiency means that additional information is attained if and only if the information is expected to change the decision, i.e. if decision takers will act on this information. In terms of the Price Relevance Model this means that the target information should always be within the inner price relevance sphere (PRS). Next (if needed under the principle of information efficiency), the outer PRS should be considered and if and only if the possibilities within this sphere are exhausted the substitutive sphere should be considered.

In the dataset there are descriptions of jumps from the inner PRS to the substitutive PRS as well as cases in which it was never attempted to find the target information. In the context of this model these information behaviors are undesirable.

"Even though we plan volumes for new products when price positioning is already completely fixed and the product is in production, the estimates are still way off." (Frank)

"It [information maximization] has a certain anchoring effect, as in: 'to avoid having no information at all, I'd rather take any information into account'. And then people cling to it like a monkey." (Gerry)

"But I think we should rather use the information we already have within our company, even if this means that we have to make estimations." (Matthias)

Hence, while maneuvering among the three spheres, pricing managers should aim to maximize the inner price relevance sphere. A deviation into the other spheres should only be allowed if it is motivated by a crucial information problem and is likely to be worthwhile. This implies that not every information need is worth interrupting the pricing process. If the approximation or substitution of a piece of information is unlikely or the acquisition costs of the additional/substitutive information are considered higher than their reward, the pricing managers might rightfully decide to accept a PRID. A strategy of mere information maximization misses the target of an efficient and professionalized pricing process.

[2] maximization in the sense of collecting as many pieces of information as possible – not to be confused with mathematical optimization as described in chap. 8.2

„... [with regard to information efficiency] that is the reason why I say: I take the fixed quantities and then I need the according production costs. [...] Only in this way can I make a decision. [...] It is only in this way that I am able to reduce [information complexity] at this specific point in time. Otherwise, of course, I would also have an urge to have all the [information].” (Daniel)

“If I have a standard product, where the price point is basically given by the competitive environment, I do not necessarily need [more information on] the end consumers' willingness to pay because it would not significantly change the market price.” (Frank)

An active stopping rule can help to prevent information maximization, such as: “In order to select a good alternative […] from a series of options encountered sequentially, a person sets an aspiration level, chooses the first one that meets the aspiration, and then terminates search” (Gigerenzer & Brighton, 2009, p. 108). Consequently, it is crucial for effective price analysis to have an active stopping rule or aspiration level in place for information gathering. This way, the distinction between information maximization and effectiveness can be drawn more easily. The stopping rule ideally applies in two situations: First, when the pricing manager finds enough (validated) pieces of information to use for price analysis and decision making. In that case, no further information is needed and pricing managers should refrain from using resources on this information problem. Second, the information problem could not be solved in a way that reliable information determines the information set, yet additional information cannot be validated or the probability of attaining more precise information is low and the process would be costly. Hence, the available information should be used cautiously, and the low reliability should be openly transmitted to decision takers.

The model describes information processing as time and resource intensive, and the more resources are involved, the smaller the marginal benefit of additional information becomes. By visualizing this discrepancy between information maximization and optimization, the model can help to further rationalize information procurement and decision making. Therefore, companies should encourage their pricing managers (i) to assess the precise information need of decision takers, (ii) to actively share the current state of information within the logic of the price relevance spheres, and (iii) to engage in careful and strict validation procedures. Interim briefings with price analysts and decision takers (instead of only decision meetings) as well as an early integration of pricing people in product development processes could help to solve the issues of information efficiency and address the frequently mentioned problem of time pressure, which poses a challenge to efficient information seeking.

Having examined the dynamics of price analysis practices in detail, these dynamics can now be integrated in the pricing process. The identification and description of triggers

that lead to deviations from the standard price-setting processes helped to answer the first research question. PRIDs are among the most prominent triggers during price analysis. As, even when following the principle of information efficiency, some pieces of information just have to be provided during price setting. This means pricing managers have to react to PRIDs and therefore deviate from their normative/planned process.

The conditions under which managers take these detours and enter into an information seeking process depend on the importance of the respective piece of information, the cost of attaining alternative/substitutive information, the pricing managers' ability to attain the information (coordination or information processes) and their access to further information sources. When pricing managers aim to approximate or substitute the target information, they make use of additional information sources, add information types and re-evaluate existing information. In other words, they redirect their focus from the original target information towards information (sets) that approximate or substitute the original target information. Afterwards, they continue their price analysis with the next piece of information. Therefore, the managers' journey through price analysis includes interruptions due to the occurrence of PRIDs. The management journey through price analysis can therefore be represented as a chain of Price Relevance Models (see Fig. 12), with each of them following the four steps of information seeking: (i) recognition of an information need and detection of an information problem, (ii) acquisition of information (represented by outward arrows), (iii) interpretation and validation (represented by inward arrows), and (iv) use of the information, which leads back to the pricing process.

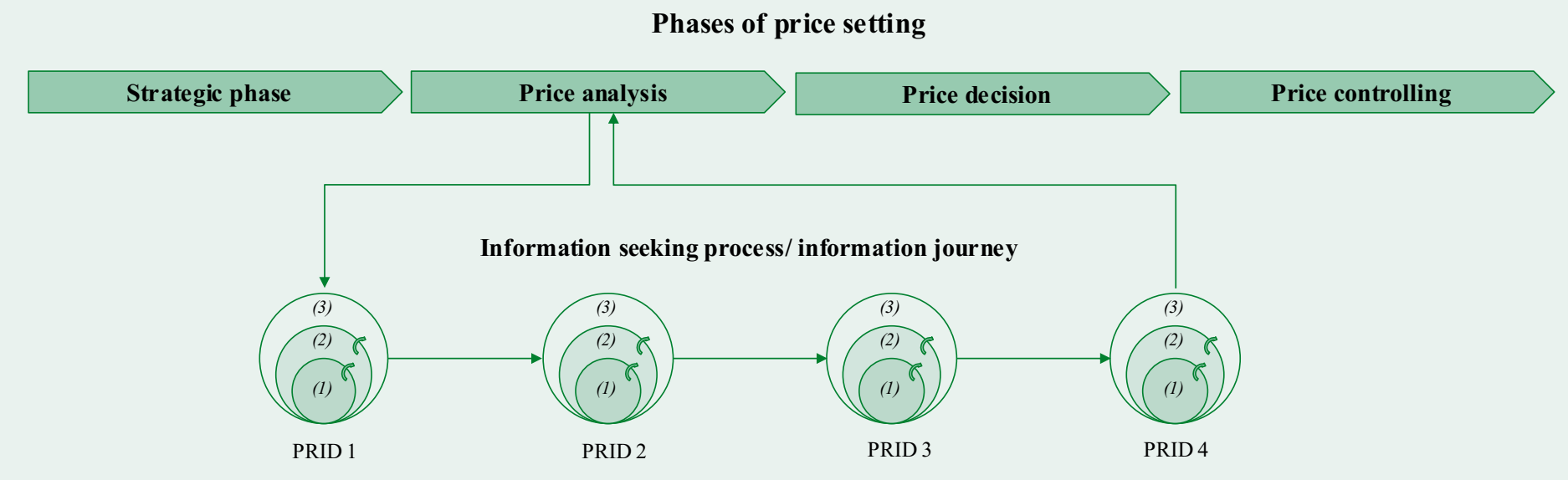


Fig. 12: Integration of the Price Relevance Model in the price-setting process

6.7. Limitations and Future Research

This study contributes to the existing literature by addressing the general understanding of B2B pricing practices (as called for in several publications, e.g., Hinterhuber & Liozu, 2017; Iyer et al., 2015; Kienzler & Kowalkowski, 2017; Totzek & Alavi, 2010a), as well as the specific information behavior of pricing managers (Achterberg et al., 2018). In particular, it sheds light on B2B information procurement and analysis in pricing. The Price Relevance Model illustrates the strategic behavior of pricing managers, conceptualizes reactions to PRIDs and shows potentials for optimizing price-relevant information behavior. Moreover, it lays the ground for several interesting research directions at the intersection of information behavior and price management, which would all help to extend the scientific knowledge on price-setting practices.

The Price Relevance Model describes the general reactions of pricing managers to information problems. Yet it does not provide descriptions of the ways pricing managers attain additional information and which heuristics are at play due to uncertainty. Hence, the results of this study can be used as a starting point for examining price analysis behavior in situations of uncertainty as well as the use of information analysis heuristics. In addition, "explanatory studies that look into psychological processes that are involved in pricing decisions" (Rusetski, 2014, p. 1740) could be built upon the exploratory results of the present study. With reference to the existing research on price decision making, the interplay between information management and different configurations of decision-making entities could represent another research direction. Furthermore, this study identified the preference of validity over availability as a professional pricing practice, thus answering Rusetski's (2014) call for future research. Yet, whether this result holds true for all price decision makers and which underlying cognitive processes are at play remains unclear (Johnson, Schulte-Mecklenbeck, & Willemsen, 2008; Rusetski, 2014). Also, the role of pricing experience in relation to pricing analysis and price estimations remains unclear. With respect to this research gap, it should be investigated how pricing managers ensure that pricing experience and knowledge are transferred and documented so as to be maintained within the company. The topic of documentation, in turn, opens a research field of its own, reaching from information documentation for compliance (as discussed above) to information transparency, information presentation and information reliability as perceived by decision takers and pricing people.

All the mentioned research paths may contribute to a better understanding of pricing managers who are currently mostly neglected research objects.

6.8. Summary and Main Propositions

In summary, the research question of this project was approached with a two-step study design and a data analysis following Grounded Theory. As a result it was found that information deficits and subsequent information problems trigger pricing managers to leave normative/planned pricing processes. In the case of a PRID, pricing managers have to react and bridge the deficit with alternative or substitutive pieces of information. This information behavior is reflected in the Price Relevance Model – a conceptual model of pricing practices which follow the detection of an information problem in price analysis. The dynamics within the model relate to the procurement, reliability, and validation of price-relevant information.

Main Propositions:

1. The price-setting process is frequently interrupted by information seeking subprocesses that fill information deficits.
2. Pricing teams should apply a stopping rule that defines the efficacy of obtaining additional information. Additionally, they can implement further individual stopping rules which should be discussed regularly.
3. In price-relevant information analysis, pricing managers should prefer validity of information over availability.

This model lays the ground for understanding pricing practices and related information behavior in price analysis. The next chapter will examine the specific reactions of pricing managers to PRIDs. In the language of the Price Relevance Model, the next studies concentrate on the movement between the price relevance spheres (arrows). They investigate how, exactly, pricing managers transition from one sphere to another during their management journey and they identify relevant heuristics applied in price-relevant information analysis.

7. Approaches to PRIDs - Strategic Bridging of Information Deficits

"Heuristic strategies are structurally simple and reliable when optimization algorithms lose feasibility, which makes them potentially the best strategies available for particular problems." (Mousavi & Gigerenzer, 2014)

"Finding the right price for a product via price-relevant information analysis" is a problem that sounds straightforward but is – as the previous chapter demonstrated – rather complex in practice. Managers often tackle complex problems by following simple rules of thumb, i.e. heuristics. When pricing managers try to complete their price-relevant information analysis despite a PRID, they have different ways, different heuristics, to do so. These heuristics are not individual, but show similar patterns with distinctive characteristics. In other words, the heuristics that can be found empirically form a pool of elements that when sorted according to their common characteristics may be classified according to a typology of heuristics. This is precisely what will be presented in this chapter: the typology of heuristics managers apply in order to bridge PRIDs. In terms of the Price Relevance Model, these heuristics are represented by the outward pointing arrows and, indirectly, also by the inward pointing ones (cf. Fig. 13). This chapter will disentangle what lies behind these arrows and present an appropriate typology of heuristics.

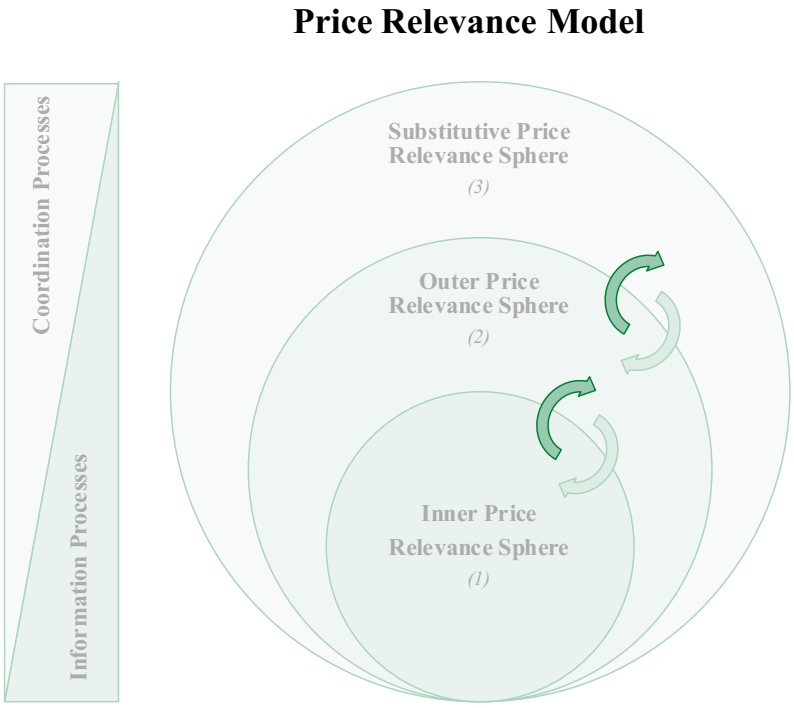


Fig. 13: PRIDs and heuristics within the PRM

7.1. Introduction

"The value of information is a concept which depends on the user of information and the context of the information being sought." (Morehead & Rouse, 1985, p. 391)

According to the findings presented above a major problem with normative models of the pricing process is the assumption of a general and broad availability of information at the right moment in time. These models also neglect time pressure, half-life periods of information, and the necessity of fast reactions in intense competitive situations. Taking the perspective of pricing units in real-world pricing situations, the assumption regarding the availability of information has to be relaxed or even rejected, and the additional factors have to be included in research endeavors.

In the previous study (chap. 6) it was established that PRIDs may cause interruptions and strong deviations from normative or planned pricing processes. Pricing managers have to bridge these gaps in order to complete their tasks, i.e. provide decision makers with the required set of information. In this chapter the focus lies on the approaches pricing managers choose in order to bridge these PRIDs. More precisely, this chapter aims to identify how managers draw on alternative or substitutional information and which sources they refer to. The corresponding research question therefore is:

RQ6: If a PRID occurs during the pricing process, how do pricing managers approach alternative/substitutive information?

While authors of normative pricing processes (cf. chap. 4.3) have analyzed this matter from a company perspective (e.g., positions to fill, tasks to assign, decisions to be taken), this project again focuses on the perspective of pricing managers experiencing the process first-hand (in line with Rusetski, 2014). To the best of the author's knowledge, this is the first study that assesses information-seeking processes in combination with pricing managers' approaches to information problems.

7.2. Theoretical Background

In addition to the literature review on price-setting processes and information behavior (cf. chap. 4), this chapter follows two further streams of literature, namely heuristics research as well as the notions of effectuation and causation in management decision making. Therefore, both literature streams will be reviewed briefly in the following two subchapters and placed into the context of price-relevant information analysis.

Heuristics and Uncertainty

Heuristics as a term goes back to the Greek language and means "serving to find out or discover" (Gigerenzer & Brighton, 2009, p. 108). Simon (1955) was the first researcher to describe the difference between *maximizing* and *satisficing* (a combination of

satisfying and *sufficing*) – the former being the search for an optimal solution and the latter being the search for a good enough solution. Based on this distinction, Simon proposed the idea of "bounded rationality", which opposed the neoclassical modelling of decisions and disrupted the hitherto predominant idea of perfect rationality (cf. Gigerenzer & Goldstein, 1996; Simon, 1955, 2000). In other words, "a complex uncertain problem often calls for a simple robust solution" (Mousavi & Gigerenzer, 2014, p. 1672). Therefore, heuristics can be described as rules of thumb which are applied in order to find a solution to complex, uncertain situations (e.g., Gigerenzer, Todd, & ABC Research Group, 1999). Heuristics can be used consciously, i.e. people use them to simplify complicated matters (Gilovich & Griffin, 2012, pp. 3–4), or unconsciously, which is often called intuition (Mousavi & Gigerenzer, 2014, p. 1673) or gut feeling. Intuition is a phenomenon that is "under-theorized", even in information behavior research (Savolainen, 2017, p. 1338), hence its effects on management decision making and within pricing are even less well understood (Bogomolova et al., 2017; Feurer et al., 2019; Mousavi & Gigerenzer, 2014). Yet, it has been proposed that intuition and gut feeling are simply the result of experienced managers' tacit heuristics (Mousavi & Gigerenzer, 2014).

Heuristics are generally applied in situations with information overload as well as situations of uncertainty. Uncertainty in this context is not to be confused with risk (e.g., Knight, 1921; Herbert Simon, 1990): "*In a situation of risk, the exhaustive and mutually exclusive set of future states are known and their consequences and probability distribution can be foreseen with certainty. … Situations of uncertainty, in contrast, are defined by the absence of perfect foresight, where the full set of states, their consequences, or the probabilities are not known or knowable*" (Luan, Reb, & Gigerenzer, 2019, p. 1738). The solution to risk problems would be a mathematical optimization, whereas (fundamental) uncertainty can only be solved through heuristics and exploratory data analysis (cf. Mousavi & Gigerenzer, 2014). "*In most business situations knowledge is much less than perfect and uncertainty prevails over risk. Heuristic strategies that are successfully used in business decision-making exploit the structure of information in the environment, rely on simplicity to overcome the complexity of situation[s], and are indispensable when faced with irreducible uncertainty*" (Mousavi & Gigerenzer, 2014, p. 1677). Especially entrepreneurs are supposed to be very effective in dealing with this level of uncertainty (Knight, 1921; Mousavi & Gigerenzer, 2014, p. 1676). Management situations usually pose conditions that are favorable for heuristics to be effective (Luan et al., 2019, p. 1736) (e.g., a certain level of uncertainty (Knight, 1921), limited opportunities to learn (Gigerenzer, 2016)).

In this understanding of heuristics the joint complexity of a cognitive task along with its environment lead to the use of heuristics (Gigerenzer & Brighton, 2009, p. 108; Mousavi & Gigerenzer, 2014; Simon, 1955). The term describing this interplay of cognition and

the environment is "ecological rationality": "A heuristic is ecologically rational to the degree it matches the structure of the environment" (Mousavi & Gigerenzer, 2014, p. 1671) and "reaches a goal, such as accurate prediction, for a certain type of task" (Luan et al., 2019, p. 1736). In terms of ecological rationality heuristics are part of an "adaptive toolbox" of strategies decision makers use in order to select and adapt the strategy that best fits the present environmental factors (Gigerenzer & Selten, 2002; Luan et al., 2019, p. 1736).

Starting in the 1970s Kahneman and Tversky conducted research that contextualized heuristics as "cognitive illusions" or "biases" (Kahneman & Tversky, 1996; Tversky & Kahneman, 1974). Conversely, Gilovich and Griffin (2012) reason that heuristics are not irrational but a rather sensible reaction to certain situations and environments: *"although the heuristics are distinguished from normative reasoning processes by patterns of biased judgments, the heuristics themselves are sensible estimation procedures that are by no measure "irrational"* (Gilovich & Griffin, 2012, p. 3). In the 1970s this central conflict regarding the (ir)rationality of heuristics led to several articles, publications and discussions and finally to two opposite ways of thinking about the subject: heuristics and biases, on the one hand, and fast and frugal heuristics, on the other hand (for an in depth discourse cf. Gigerenzer, 1996, 2011; Gigerenzer & Brighton, 2009; Kahneman & Tversky, 1996).

Along with this central conflict, the perception of heuristics also changed in the field of information science from being the "method that makes computers smart to one that explains why people are not smart" (Gigerenzer & Brighton, 2009, p. 109). Savolainen (2017) gives an overview on how researchers have approached heuristics in information seeking since the 1970s. An important distinction refers to the strategic and tactical level of information-seeking processes. The overall (information-seeking) strategy is captured in the Price Relevance Model (cf. chap. 6.4), whereas heuristics, i.e. tactical moves (Harter, 1986), are the subject of the present study.

The Logics Underlying Management Strategy: Effectuation and Causation

A causal logic is based on the premise: To the extent we can predict the future, we can control it. An effectual logic is based on the premise: To the extent we can control the future, we do not need to predict it. (Sarasvathy, 2008, p. 22)

While chapter 4.4 merely broached the logics underlying management strategy and tactics, this subchapter elaborates on the causation and effectuation theory. In 2001 Sarasvathy researched the logics of management strategy. She found that entrepreneurs follow a distinctive way of information processing with regard to their strategy and called their logic "effectuation". This logic is based on the idea of control and opposes the principle of predictive rationality that she calls "causation". In her definition "*causation*

processes take a particular effect as given and focus on selecting between means to create that effect. Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means" (Sarasvathy, 2001, p. 245). As an example she uses the idea of a chef cooking a meal either by deciding upon the menu, shopping for the required ingredients and searching for a way to effectively prepare the dish (causation), or by going through the pantry and combining the available ingredients to one of many possible dishes (effectuation) (Sarasvathy, 2001). Another picture often used to describe the two logics is to refer to causation as a jigsaw puzzle whereas effectuation would rather be seen as a patchwork quilt (Sarasvathy, 2008). In other words, the difference is one between a "many-to-one"- and a "one-to-many"-mapping as depicted in Fig. 14 (Sarasvathy, 2001, p. 245). Therefore, "predictive rationality takes the environment as largely outside the control of the decision maker, who therefore attempts to predict and adapt to changes in it. In an effectual view, the environment is endogenous to the actions of effectuators, who therefore attempt to co-create it through commitments with a network of partner, investor, and customer stakeholders" (Read, Dew, Sarasvathy, Song, & Wiltbank, 2009, p. 2). The two types of logics are described as "integral parts of human reasoning" that "can occur simultaneously, overlapping and intertwining over contexts of decision and actions" (Sarasvathy, 2001, p. 245).

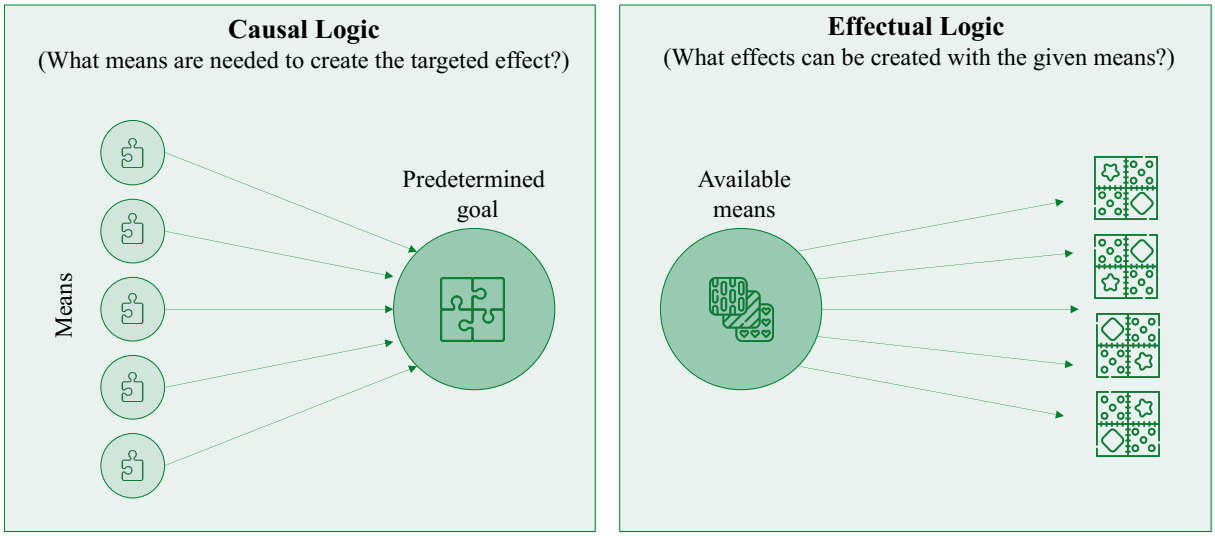


Fig. 14: Causal and effectual logics (based on Sarasvathy, 2001)

The two logics differ in a range of dimensions, which have been juxtaposed several times by various researchers. The original comparison, which summarized the differences best, can be found in Sarasvathy's publication of 2001. Read contributed to Sarasvathy's original work by defining the causal and effectual strategizing processes in marketing under uncertainty (Read, Dew, et al., 2009) (see Fig. 15).

In later publications five core principles of effectuation were identified and operationalized that distinguish it from causation (Chandler et al., 2011; Frese, 2014; Küpper, 2010; Read, Dew, et al., 2009; Sarasvathy, 2008): bird-in-hand, affordable loss, crazy quilt, lemonade and pilot-in-a-plane.

- The *bird-in-hand principle* refers to the orientation towards means (effectuation) rather than starting from the goal to be achieved (causation). It starts with the central actor (e.g., the entrepreneur) and continues with their means: namely, identity (who I am), knowledge (what I am), and networks (whom I know) (Sarasvathy, Kumar, York, & Bhagavatula, 2014, p. 73). Then, following effectuation logic one asks "What can I do?", whereas causation logics would lead to the question "What should I do?". In other words, effectuation logic starts with "existing and accessible means" and transforms them into resources (Karami, Wooliscroft, & McNeill, 2020). The degree to which decision makers refer to this means-based logic and its relation to venture performance was researched, among others, by Read, Song, and Smit (2009). Küpper (2010) found that the influence of the bird-in-hand principle positively influences outputs of R&D projects. Yet, he also identified differences of this relation according to various innovation degrees.
- The *affordable loss principle* shows that following the effectual logic the central actor focuses on what they can afford to lose instead of what they hope or expect to gain from a decision (e.g., a new company or project) (Sarasvathy, 2008). Hence, KPIs based on expected returns (e.g., return on investment) become irrelevant under effectual reasoning. Along with a reduced planning time (Sarasvathy et al., 2014), this principle contributes to higher process efficiency (Brettel et al., 2012).
- The *crazy quilt principle* is concerned with partnerships as a crucial means for the expansion of resources. Hence, following effectuation logic central actors aim to attain the commitment of stakeholders which they acquire through their current network or through expanding their network. In contrast, the causal approach would be the identification and targeting of matching stakeholders (Sarasvathy, 2008; Sarasvathy et al., 2014). The critical factor for "effectual relationships" is the kind of stakeholder commitment where both parties share risks as well as rewards (Chandler et al., 2011). The uncertainty reduction in this case comes from a diversification of risk and through the commitment of third parties, whereas in a causal logic uncertainty is reduced by market analyses (Chandler et al., 2011; Küpper, 2010).
- The *lemonade principle* describes how central actors react to surprise – whether they are able to turn lemons into lemonade instead of avoiding surprise. In effectual reasoning one would leverage surprise, overcome it and adapt to it (Sarasvathy, 2008, p. 21). "Effectuation posits that they may benefit from

embracing surprises rather than following a linear and goal-oriented process that seeks to avoid deviations from the plan" (Sarasvathy et al., 2014, p. 75). In contrast, causal models are a better fit to situations with stable circumstances (Frese, 2014). Embracing the unexpected has been proven to positively influence R&D output, especially in highly uncertain and innovative contexts (Brettel et al., 2012).

- The fifth principle, *pilot-in-a-plane*, connects the first four in that it adds the role of human beings in shaping the future (Sarasvathy, 2008). Thus, effectual actors "consider themselves one of many who copilot the course of history" rather than exogenous trends determining the future (Sarasvathy et al., 2014).

Causal and effectual reasoning are both integral parts of human reasoning processes. None of them is considered superior, rather, they co-exist and are occasionally even used simultaneously. However, for theorizing they should be treated as a dichotomy as proposed by Sarasvathy (2008). They are comparable with Mintzberg's (1978) planned strategy (causation) and emergent strategy or Wiltbank's (2006) non-predictive strategies (effectuation). Effectuation theory is seen as part of the resource-based view (RBV) of a firm although the RBV understands resources as valuable ex ante (Barney, 1991) while effectuation theory generally treats the combination of means as a resource (Read, Dew, et al., 2009). Only through processing do "existing means turn out to be valuable resources or useless means" (Karami et al., 2020, p. 780). Over the years several literature reviews have analyzed and deepened the understanding of effectual theory as such (Dias, Sadao Iizuka, & Vilas Boas, 2019; Grégoire & Cherchem, 2020; Perry, Chandler, & Markova, 2012; Reuber, Fischer, & Coviello, 2016), or in relation to venture performance (Read, Song, et al., 2009), the concept of foresight (Djuricic & Bootz, 2019) and internationalization (Karami et al., 2020).

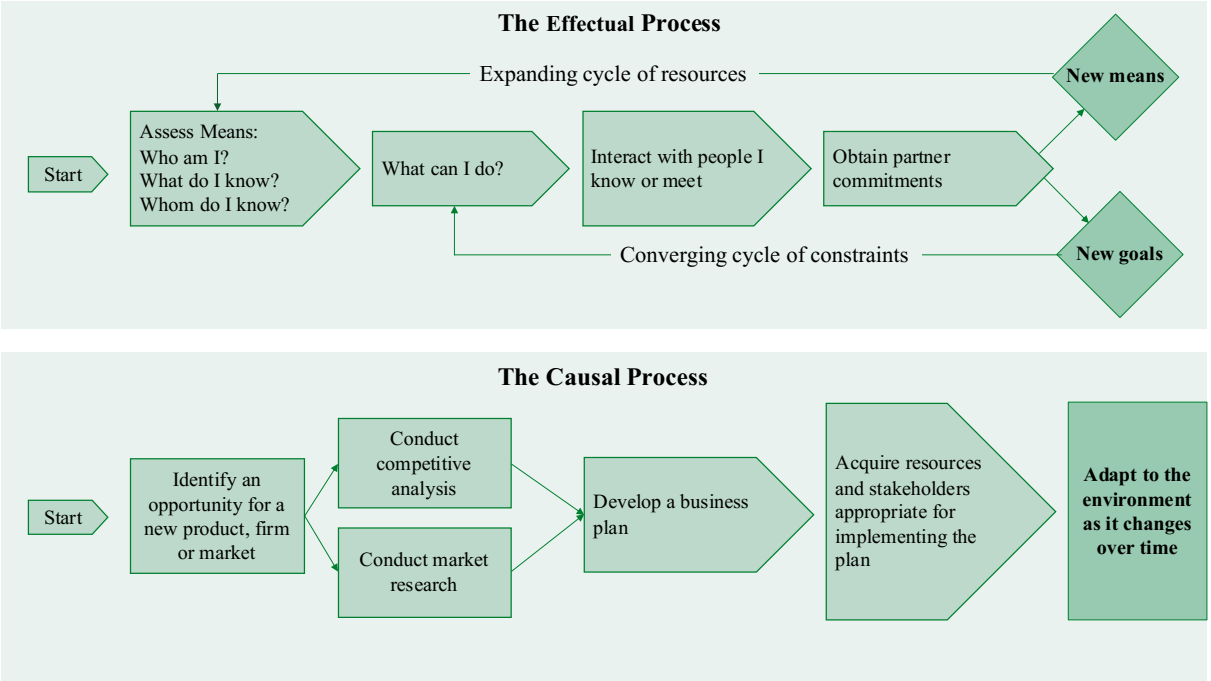


Fig. 15: The effectual and the causal process (Read, Dew, et al., 2009)

The Theories of Heuristics and Management Strategy: An Integration in Price Analysis

Van Bruggen et al. (Van Bruggen, Smidts, & Wierenga, 2001) laid the ground for connecting information seeking and heuristics with marketing decision problems, and this thesis follows their research stream in relation to price setting. According to the reviewed criteria for situations in which managers are known to use heuristics, B2B pricing situations qualify in all dimensions. The situation pricing managers face when lacking price-relevant information and trying to bridge these PRIDs is one of uncertainty (as described by Gigerenzer & Brighton, 2009). In some cases it is a situation of fundamental uncertainty, as the outcome, the inputs and the probabilities all remain uncertain. Some authors even call the situation "ambiguous" because price decisions are subject to a variety of constraints and are "susceptible to intuitive decision making" (Rusetski, 2014, p. 1734). Furthermore, the environment of a pricing decision is a highly complex one (in accordance with Simon, 1955) in terms of information procurement, analysis, sources and inter-functional collaboration. At the same time, volatile market situations and competition lead to time pressure, which, in turn, favors the use of heuristics in pricing (Totzek & Alavi, 2010b). As discussed in prior chapters, these characteristics also apply in situations of PRIDs: they are usually time sensitive and often prone to cognitive overload (Savolainen, 2017). Also, pricing managers frequently emphasize the role of experience in price management tasks, which was shown to be highly beneficial if the level of uncertainty in a situation is high (Perkins & Rao, 1990) and

information inputs are rare (Van Bruggen et al., 2001). In the established literature, marketing researchers have investigated heuristics in pricing before, but usually they focused on heuristics in the phase of final price decisions (e.g., Banker & Hansen, 2002; Li & Graves, 2012; Rusetski, 2014).

Consequently, pricing managers are confronted with complex problems in price analysis and an environment of uncertainty and limited (timely) information. Heuristics can therefore serve as efficient problem-solving strategies in pricing and especially in B2B pricing situations (cf. chap. 4.1). The specific heuristics applied in price analysis have been investigated only sporadically so far, which is why this study aims to identify the different types of heuristics in price setting according to market situations and underlying cognitive processes.

According to the theory on heuristics it can be stated that effectuation is a logic that comes into play when high levels of uncertainty prevail and historical data are not adequate for predicting future events (cf. uncertainty models by Knight, 1921). "Effectuation provides heuristics that use the nonpredictive techniques that are characteristic of expert decision making in entrepreneurial settings" (Read, Dew, et al., 2009, p. 5), whereas the causation logic usually relies on predictive techniques. Assuming that the market situation managers operate in is exogenous, they adapt accordingly. In such situations they rather resort to the estimation of risk and probabilities, i.e. predictive techniques.

The phase of price analysis is similar to entrepreneurial settings for several reasons: Firstly, pricing managers usually operate under (different levels of) uncertainty, as elaborated in subchapter 7.2. Therefore, their tasks usually call for the use of heuristics in order to reduce complexity and speed up the analysis process. Secondly, determining the adequate price of a product is a complex task that is mostly unsolvable due to information deficits and dynamic market environments. And lastly, the availability of means needed to acquire necessary information and reduce uncertainty differs depending on the company's infrastructure, the internal and external resources as well as the barriers to information access in a specific context.

This connects to the argument of the initial literature review (chap. 4), which stated that normative price-setting process models do not take into account the pricing realities, in that real pricing processes are frequently interrupted and pricing managers are thrown back to previous stages. In subchapter 6.3 it was shown that PRIDs are frequent reasons for such interruptions. Seeing these normative process models from an effectuation theory perspective, the presented price-setting models from established literature are mostly based on the causal logic. While causation is just as much an integral part of human reasoning as is effectuation, the initial critique of missing parts of pricing realities can be resolved through the effectuation theory lens, which allows for iterative

processes (cf. Fig. 15). Therefore, the author argues that, following effectuation theory, the normative pricing models have to be extended in order to allow for causal as well as effectual reasoning in all steps of the pricing process.

With the argument of iterative pricing processes, the acknowledgement of pricing as a complex problem and price analysis as a task with serious levels of uncertainty, pricing heuristics open a field of research that has not enjoyed much attention yet. This chapter addresses the specific heuristics used in price analysis, especially in the face of information problems. By providing a typology of heuristics used to bridge PRIDs, this study further refines the understanding of pricing practices.

7.3. Data Collection and Methodology

Previous research results of this thesis indicate that the ways in which pricing managers optimize information sets and bridge PRIDs are diverse but not fully individual. The reactions to PRIDs share certain characteristics (across pricing managers and companies). These shared characteristics have evolved despite pricing managers' different education (there is no standardized pricing education, pricing is rather a skill acquired "on the job") and although expert exchanges are rare (pricing managers cannot share strategies among each other due to the sensitive nature of pricing). Therefore, this research project focuses on said characteristics of heuristics in price analysis used for attaining alternative/substitutive information. Specifically, the heuristics used are identified on an individual level, common characteristics are clustered, and subsequently they are summarized in the typology of heuristics. Following this inductive approach, the typology is developed in a two-step research design which will be described in this subchapter.

Study 1

Pricing managers were interviewed with the aim of exploring how they cope with PRIDs. For the interviews the guidelines for expert interviews provided by Jäger and Reinecke (2009) were followed. Again, special attention was paid to the pricing managers' descriptions of their realities. This is for two reasons: First, one of the major interests of this thesis is the conceptualization and understanding of pricing realities. Second, by doing so the interviewer becomes aware of the context, circumstances, and connections of the expert's reality (Jäger & Reinecke, 2009, p. 66).

The first round of interviews was used for pre-testing, as suggested by Jäger and Reinecke (2009, p. 70), and the transcripts were therefore excluded from the analysis. The final dataset comprises semi-structured expert interviews within 17 B2B-companies. The participants are pricing managers in the industrial sector (from various industries, e.g., construction site equipment, medical equipment, fire fighter equipment, bathroom appliances, automobile tires, shop fitting). The interviews were all transcribed verbatim and were analyzed following the qualitative content analysis approach

according to Kuckartz (2018), which in major parts follows the five steps of creating typologies in social sciences (cf. Fig. 16). The presentation of the study results will follow the same structure.

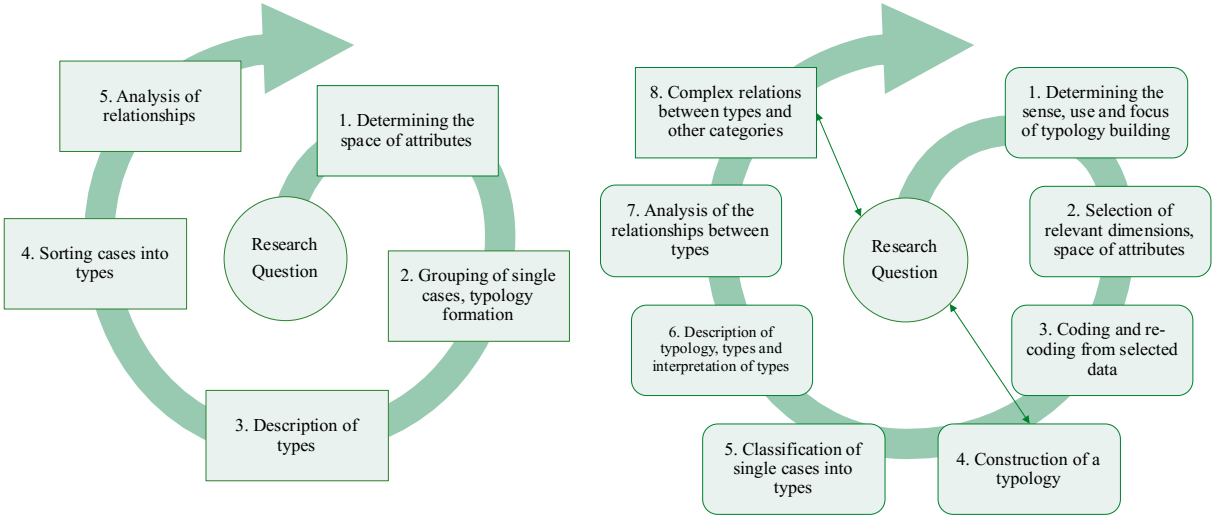


Fig. 16: Creating typologies in social sciences (left) (Kuckartz, 2018, p. 148) and specifically in qualitative content analysis (right) (Kuckartz, 2018, p. 153)

Study 2

In a second step, the created typology was discussed and refined with a focus group of pricing managers from the Pricing Panel (cf. chap. 5). The focus group heard a 15-minute presentation of the study results including a description of the identified heuristics (steps 1–3 according to Fig. 16). After that they were asked to sort specific heuristics into the typology and describe whether and where they find their own behavior in the typology (steps 4–5 in Fig. 16).

This two-step research design strengthens the reliability as well as the validity of the results and provides a robustness check when confronted with pricing realities.

7.4. The Typology of B2B Pricing Heuristics

"The responsible pricing managers were not able to fully justify their decisions. Therefore, they often relied on rules of thumb" (Kermisch & Burns, 2018, p. 50)

As repeatedly elaborated in previous chapters, the information situations of pricing decisions are diverse. They differ due to environmental influences, industry-specific characteristics and regulations, product characteristics and newness, as well as the specific configuration in which differs for each new product pricing process. Nevertheless, commonalities can be found within the long list of tactics used in reaction to information

problems in price setting. The single heuristics used in pricing practice can be categorized according to these commonalities. “At the core of creating typologies is the search for multidimensional patterns which facilitate the understanding of a complex topic” (Kuckartz, 2018, p. 143). This level of generalization is necessary to describe situations of pricing managers as precisely as possible but without excluding any relevant cases. In the field of industrial marketing this method has often been applied to derive knowledge from B2B practice (Weiber & Wolf, 2015). Creating a typology can help overcome difficulties in accessing research objects (in this case pricing managers) and represent the multitude of influences on real-world processes (Kossmann, 2008a, p. 184).

Here, a typology was created that categorizes the various approaches into four homogeneous groups. The observed reactions to PRIDs show similarities with regard to strategic reasoning and market transparency. Consequently, the types can be distinguished along these two dimensions, which results in a typology represented as a 2x2 matrix.

The following subchapters document the steps of creating this typology according to Fig. 16 and end with an evaluation of the typology.

Compiling the Space of Attributes and Finding Commonalities

In the course of information analysis pricing managers often and repeatedly encounter missing information, so-called PRIDs. They compensate and bridge these deficits with information from the other price relevance spheres (represented by the arrows in the Price Relevance Model in chapter 6). To create a typology, all the actions that managers take in response to an information deficit are compiled into a long list of heuristics. Afterwards, these heuristics are grouped according to their attributes (see Table 4).

Typology component	Explanation and/or examples
Domain of typology	This typology classifies types of approaches to – or heuristics used for – information deficits within the phase of pricing analysis. Consequently, heuristics used in pricing decisions or other phases of the price-setting process are excluded from analysis.
Extract from typology elements in the dataset	Customer survey; best practices/success stories; margin calculations; scenario models; modeling/simulation; sales employees' price information; hearsay from fairs; trade shows; identification of product features and their unique value proposition; comparison of products with respect to competitors' products; system of weighting product features and their value; standardized price calculation formulas; expert opinions on demand/sales; external experts such as consultants or associations …
Attributes	Strategic, mathematical, methodological, people-based, capability-based, market access, information access, product-oriented, background/education, search for real information, search for meta-information, skill-based, orientation towards present means, orientation towards (achievable) goals
Characteristics and respective groups	• high/low barriers to market information • means vs. goal orientation, exploiting knowledge vs. exploiting contingencies, predicting the future vs. controlling the future
Classification Criteria	• Barriers to price-relevant information in the market • Strategic reasoning according to Sarasvathy (2001)

Table 4: Typology development

Describing the Heuristics Using Empirical Evidence

Next, the dimensions of the typology were defined with reference to existing scientific knowledge on management strategy. Two central dimensions were determined that distinguish the four types of heuristics. One dimension refers to the degree of information barriers in a market (market transparency). The second dimension represents the degree of causation and effectuation underlying a heuristic (strategic reasoning). Fig. 17 shows the matrix created by these two dimensions. Depending on the predominant underlying reasoning and the specific information situation the reported approaches may be

categorized into one of the four quadrants of heuristics defined by this matrix: the market-oriented, the statistical, the methodological, or the networking approach.

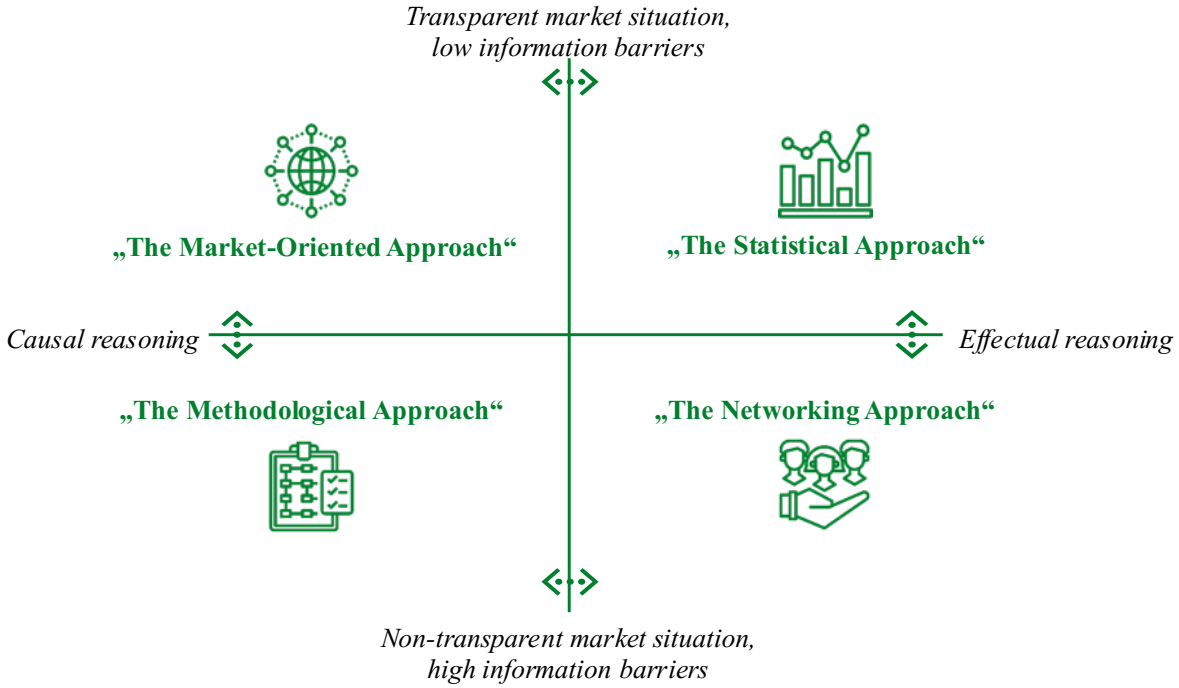


Fig. 17: Typology of heuristics used to bridge PRIDs

The Market-Oriented Approach

The upper left quadrant of the typology is characterized by a market situation of low information barriers and the predominant use of causal reasoning. Thus, heuristics in the market-oriented approach aim to extract knowledge directly from the market using market research tools or external expertise in order to provide some estimate for the missing information. In practice, a typical market-oriented heuristic would be the prediction of demand for a new product by employing market research on actual and intended consumption. Another specific heuristic was described by Jürgen:

“We know the pricing structures of our competitors, because the costs for raw materials are the same for everyone. When someone produces in country X or Y, we can estimate their production costs and thus approximately know their lower price limits. [This is derived from our] experience and market knowledge, market intelligence. We have the advantage that the number of competitors is manageable, we have known each other for many decades, which makes [the market] relatively transparent even if it isn’t.” (Jürgen)

With this heuristic, managers make use of available tools they are familiar with so they are able to assess the probability of success. The resulting alternative/substitutive information provides pricing managers with a clearer picture of the market situation in which they operate. Assuming the environment (i.e., consumer preferences and competition configurations) are relatively stable (cf. Sarasvathy, 2001), this causal approach can lead to a valuable bridge of PRIDs. Yet this type of heuristics highly depends on the access to market information. With higher information barriers this heuristic would not be feasible. Instead, causal reasoning would lead to the use of the methodological approach.

The Methodological Approach

With a tendency to causal reasoning and high information barriers, pricing managers can bridge information deficits with a methodological approach. Such heuristics aim to structure the information environment and acquire means mostly from within the own company in order to approach the originally targeted information. An example of a methodological heuristic would be the identification of product features and their added value evaluated by cross-functional company experts in a self-developed evaluation system.

"We first look at the degrees or percentages to which single criteria enter into a buying decision. […] First there are commercial product features, […] such as ease of use, user safety, but there is also the relationship to each customer and the difference it makes. [Then] there is a catalogue of criteria from which we choose for each business area based on the specific data. In practice, every one [of these features] has an assigned weighting factor, and then we compare our products to those of our competitors. […] All these aspects are the criteria of the customers that we assume to the best of our knowledge. […] Usually it is quite a tough discussion process, […] which is why a moderator works with us who asks critical questions. […] This team encompasses colleagues who know the market, from sales or from product management. We calculate the perceived customer value according to a 10-point system. […] This evaluation is market-oriented. If we know a colleague has a lot of product and market knowledge, they can be part of the team." (Stefan)

This type of heuristic starts with the goal to bridge a specific information and collects or acquires means to reach this goal. Uncertainty is reduced by analyzing the environmental conditions of a market situation in the best way possible, which leads to the formulation of a well-thought-out pricing plan. This causal approach assumes a relatively stable environment (Sarasvathy, 2001), which, especially in innovation-driven markets, can be a risky assumption.

The Networking Approach

Effectuation-based heuristics can be observed in rather unstable environments, where pricing managers are not able or assume to be unable to predict the future. Therefore, these heuristics start with the means at hand and help to reduce uncertainty by involving relevant and strong stakeholders. Thus, they help to adapt quickly to opportunities and to exploit contingencies.

These heuristics approach PRIDs by starting from the own identity, knowledge and network, i.e. the corporate and individual resources. In combination with high information barriers, this approach results in the networking heuristic. In practice, pricing managers using this heuristic tend to turn towards the existing means, such as tacit knowledge of sales personnel on consumers' willingness to pay. If the barriers to market information are high, it is reasonable to access the company's internal resources and even structurally document the information extracted from the network.

"In the past we often conducted a price sensitivity survey among our sales personnel. So we said: Folks, looking at your current business, make a rough guess what happens to the quantities if we change prices by 2%, 4%, 6%, 8% – so practically a price elasticity survey. Of course, there are always people who will say that 2% increase in prices results in a quantity loss of 60% […] and the world ceases to exist. (laughs) […] price elasticity in B2B is often overestimated." (Gernot)

„We built a price information tool within our CRM, where our sales force has to register every feedback they receive. We collect these [pieces of information] in a structured manner. […] Each entry has to be processed by a product manager and then it will be decided whether prices are adapted or not. […] On average we receive one entry per day." (Matthias)

"So we have a tool now. […] It gives us a couple of interesting options. One of it is the feedback option, where you can create a case in the tool for every price complaint we received. And we love price complaints, because it gives us information on customers. [When we set prices] we can review the parts which have price complaints and ask ourselves, whether our strategy was correct and what we can improve." (Irina)

The Statistical Approach

With a relatively more transparent market situation, the information sources at hand are manifold. The statistical heuristic can therefore contribute to PRIDs in that the focus lies on combining data and extracting alternative/substitutive information from publicly or internally available datasets. One practical example would be to develop a statistical model which is able to estimate the competition prices based on the final list prices as well as the configurations of products (e.g., Schmutz, 2018).

"We have a multivariate regression model. […] Estimations in B2B contexts are quite hard. We have a colleague in IT, head of the advanced data analytics team, who has a Ph.D. in stochastics, and he helped us build it [the model]. […] But it helps to have at least an approximate value at hand. […] Furthermore, we are currently developing a benchmarking model [to identify] loyal and less loyal customers. From there we are building a term prediction, which uses data on customer behavior and will help us estimate at which price level customers will leave us […]." (Matthias)

Analysis of the Relationships Between the Heuristics

As the descriptions above show, empirical evidence for all four types can be found in the data set. As the next step, the dynamics and relationships between the heuristics will be examined.

The four identified heuristics are to be seen as four approaches pricing managers take in order to bridge PRIDs. However, evidence from both studies suggests there is a certain dynamic between them since each PRID may be approached with more than one heuristic and pricing managers can and often do switch among the four types. Such switches create flexibility and ensure that pricing managers can adapt to situational challenges. At the same time, building the skills and circumstances to switch can entail significant costs in terms of money, time and effort. A switch along the vertical axis (market transparency) is usually attained by initiatives in data development (see next subchapter for a detailed example) or by the acquisition of new data sources. These measures involve costs for information processes: either for the efforts pricing managers make or in the form of direct costs incurred by data acquisition.

"We have a huge base of already installed machines. We know, where they are installed, how they perform, when the spare parts were replaced and when they should be replaced. If we were able to improve the data base and the predictability we could make it useable for pricing, this would be a reliable information source. […] I think we would need more resources here. Yet, we have been trying for 20 years to harmonize data, but the computer languages the machines work with are different. Only now we are able to make them talk." (Irina)

A switch along the horizontal dimension (causation and effectuation) involves a change in the way pricing managers think about price analysis strategy. They have to alter their mindset and acquire additional skills – or make use of skills existing in other business units in their company. Such measures entail costs in the coordination processes. The exact drivers of both logics in price analysis remain to be investigated (cf. chap. 8).

Brettel et al. (2012) state that the ambidexterity of planned and adaptive approaches (causation and effectuation) is crucial in coping with uncertainty – be it a contextual ambidexterity or the just as important ambidexterity in internal processes. In summary,

the results of the present research suggest that price analysis (as an internal process that depends on environmental changes) would benefit from ambidexterity of pricing managers. Hence, the ability to switch between heuristics can be a valuable asset of pricing teams in situations of uncertainty. In the long run, the optimization and combination of these heuristics can sustain competitive advantage.

In-Depth Interpretation of a Case

This subchapter provides in-depth insights into one specific case from the automotive supplier industry. This case illustrates how the pricing team developed an initiative to influence the level of market transparency, corresponding to a switch along the vertical axis of the typology matrix. Although such switches involve costs in terms of time and effort, the increased data richness is able to serve as a further information tool in price analysis beyond one specific process.

Matthias' company operates in a multi-tier market and collaborates with local re-sellers. Hence, their direct customers are not consumers but re-sellers – in other words, a classical B2B setting. The implications of this market setting are that the company's sales information is just part of a bigger picture and they are not allowed to exchange market and price information with competitors.

"We have an enormous amount of data and we are quite good in defining more and more KPIs, which bring us a bit more profit. […] Yet, with him [data scientist] I am trying to integrate the data in our systems and transfer them to one platform, in order to be able to complete certain analyses within minutes. In this way we can extend our use of statistical models and detect coherences."

In terms of the presented typology this means that Matthias and his team try to become more flexible in price setting. They do so by increasing their timely access to market data, which enables them to use related heuristics in their price analysis process. Yet, not only do they ensure timely data, they also open doors to new information by actively increasing data richness. For this purpose, they use openly available data on re-sellers, process them, and compare them to their own internal transactions with the re-sellers. This results in a benchmark indicating market potential and provides information on competitors.

"If our numbers say that a re-seller is doing very poorly, this does not mean that they are not doing well in general. They might just be buying elsewhere as well. If they buy 1000 [products] from us and have 4 technicians in their shop, we know that 250 products are sold per technician per year. This is one KPI in relation to productivity. The other one is this number in relation to registered vehicles in this area (we have the dataset of registered vehicles per city code). In this way we can determine re-sellers' market shares and market potential since we know the frequency with which products

have to be replaced. […] Thanks to these KPIs we can compare re-sellers and […] develop a ranking. At the moment we are integrating all the information we have in this system."

This initiative to increase market transparency will help them with several PRIDs, e.g., regarding the market potential of certain re-sellers as well as the related information on price levels. It allows them to investigate problems in their sales potential and even draw inferences regarding their price levels.

"Now we would like to understand the reason [for low sales numbers of a specific re-seller]. There are quite a lot of potential reasons and we try to account for them. One of them is, for example, the density of competing companies. […] Recently, we have created a competition map, so we can derive the number of competitors [of active re-sellers] in a radius of 5 to 10 kilometers. […] And this information is combined later on. This gives no indication of the quality of our prices, but it helps us understand where and why we perform poorly. If in the end [we find that] price is an issue, we have achieved a great deal. I believe none [of our competitors] has such a tool yet."

There are two reasons why Matthias might be right in assuming this to be an innovative approach: Firstly, their approach combines many resources available within the company with publicly available data. For this approach to work, certain skills in collecting, cleaning, and processing data have to be available. Which leads to the second reason, namely, the capability to estimate and to use the potential of existing resources. These skills in itself strongly hint at effectual reasoning. The following quote of Matthias especially emphasizes this strong tendency towards effectual thinking.

"We are not extremely professional in comparison to other companies, because we simply do not have the possibilities. […] Yet, I believe we make the best of what we have at our disposal."

In the specific configuration this case presents, i.e. a high degree of effectuation and an increase in information transparency, the pricing team aims to develop their price analysis in such a way that the statistical heuristic becomes part of their pricing tools.

7.5. Discussion

The research presented in this chapter proposes a typology of heuristics in price setting that addresses RQ6 ("*If a PRID occurs during the pricing process, how do pricing managers approach alternative/substitutive information?*"). The reactions of pricing managers to PRIDs are captured in four heuristics along the dimensions of market transparency and the underlying strategic logic (causation/effectuation). With the presented results this chapter explains how pricing managers approach alternative or substitutive information after having detected a PRID. Thus, it further develops the

conceptualization of information behavior in price analysis started with the Price Relevance Model in chapter 6. Together, these conceptualizations contribute to the overall research objective of this thesis (RQ1) in that they identify and describe patterns of information behavior that are not consistent with normative pricing models and define price-setting realities.

Prevailing models of the price-setting process are mainly based on causal principles. Yet, some of them already hint at the complexity of pricing situations where the different stages of price setting have several layers that are not represented in the normative models (cf. chap. 4.4). In fact, information acquisition, which interrupts the stage of price analysis, is considered a strategic pricing capability (Achterberg et al., 2018). Therefore, different modes of strategic reasoning can underlie the information behavior of pricing managers. In practice, causal logics as well as effectual logics are integral parts of human reasoning (Sarasvathy et al., 2014) and come into play under different circumstances. Especially in management situations with higher degrees of uncertainty and highly innovative products, effectual reasoning was observed in managers' behavior (Read, Dew, et al., 2009). Since pricing situations show different levels of uncertainty (with especially high levels in new product pricing, lower levels in price adaptations), models of price-setting processes should incorporate both types of logic. Thus, the presented typology of price-setting heuristics complements existing pricing models and integrates the various modes found in price-setting practices. It thereby further deepens the understanding of pricing practices and contributes to the research on the micro-foundations of pricing (Hinterhuber & Liozu, 2017).

Pricing managers of the Pricing Panel (chap. 5) found this typology especially helpful in three ways: First, the pricing managers were able to evaluate their own practices and configurations within their pricing teams. Second, using this self-evaluation tool they were able to define specific measures that help them create an environment in which both types of logics can flourish. Third, the model's dynamic of switching between heuristics is in line with their own approaches that use resources in more than one way and assess specific PRIDs from different perspectives.

"In principle, we identify with each of the four quadrants and we are able to confirm that the switches make sense. Also, [we agree with] the interplay of the internal and the external perspective, as well as the support from market research institutions. Yet, the key challenge is to find a point of orientation. […] It is the in-depth understanding and elaboration that is […] the real challenge in companies."

"But what can I do when I have collected all data which will support the pricing decision? […] Developing a methodology which accounts for different pricing methods is where I see challenges at the moment."

„Yet, for some countries or regions or products the availability of such data is not really good. Then one automatically reaches out to the internal knowledge."

Thus, pricing managers can use this typology and its dynamics to evaluate potential fields of professionalization for their own company processes. Moreover, they can deliberately assemble their pricing teams and actively practice re-thinking their price analysis measures. They also agree that rarely is it only one heuristic that is applied to cover a PRID and they consider these switches as positive measures in the pricing process. It remains to be investigated quantitatively which heuristics prevail and whether there are patterns of "preferred" heuristics.

After confirming the usefulness of switches between heuristics, the Pricing Panel proposed a hypothesis that builds on the idea of "preferred heuristics": They proposed a sequential use of heuristics. According to them B2B pricing managers might start by applying causation-based heuristics and switch to other heuristics if necessary. Indounas (2020, p. 1867) found that pricing managers tend to exhibit "either myopic or mechanistic persistence" on internal information. In connection with the Pricing Panel's hypothesis, this would mean that B2B pricing managers tend to start with the methodological heuristic and progress from there towards the networking, the market-based and the statistical heuristic. This idea is an interesting lead for future research and will be pursued in the upcoming studies.

Related to this hypothesis, it would also be an interesting path for future research to investigate the effects that different (sequences of) heuristics have on price performance or pricing team efficiency.

Lessons Learned

- When a PRID occurs, pricing managers approach alternative/substitutive information through four different heuristics. Which one they use depends on the level of market transparency and the prevailing underlying logic applied by them.
- Pricing managers can and even should switch between heuristics in price analysis to gain a picture of their pricing situation from more than one perspective.
- When switching between heuristics, pricing managers and their superiors should be aware of the costs these switches involve. Therefore, it has to be defined who authorizes further measures in price analysis, i.e., who determines the appropriateness of costs in relation to expected information gains.
- Since pricing managers are the ones who can best assess their information set and its reliability, it could be favorable to leave the strategic decisions of information acquisition to them. Properly discussed stopping rules (cf. chap. 6)

allow superiors and decision takers to interfere in information procurement and determine the milestones of these information measures.

- Pricing teams should encompass people with different approaches in action to allow for the full application of all the heuristics. Furthermore, deliberately creating spaces for both logics in a team can help pricing managers to rethink their resources and goals.

Evaluation of the Typology and Limitations

A basic evaluation criterion that was developed in practice but is also advocated by researchers (cf. Eppler, Hoffmann, & Pfister, 2011; Lee & Chen, 2018) requires that categorizations (be that typologies, taxonomies or categorical frameworks) should be "mutually exclusive and collectively exhaustive" (MECE) (Rasiel, 1999, p. 6). The graphical representation by Lee & Chen (Lee & Chen, 2018) illustrate the MECE principle (Fig. 18).

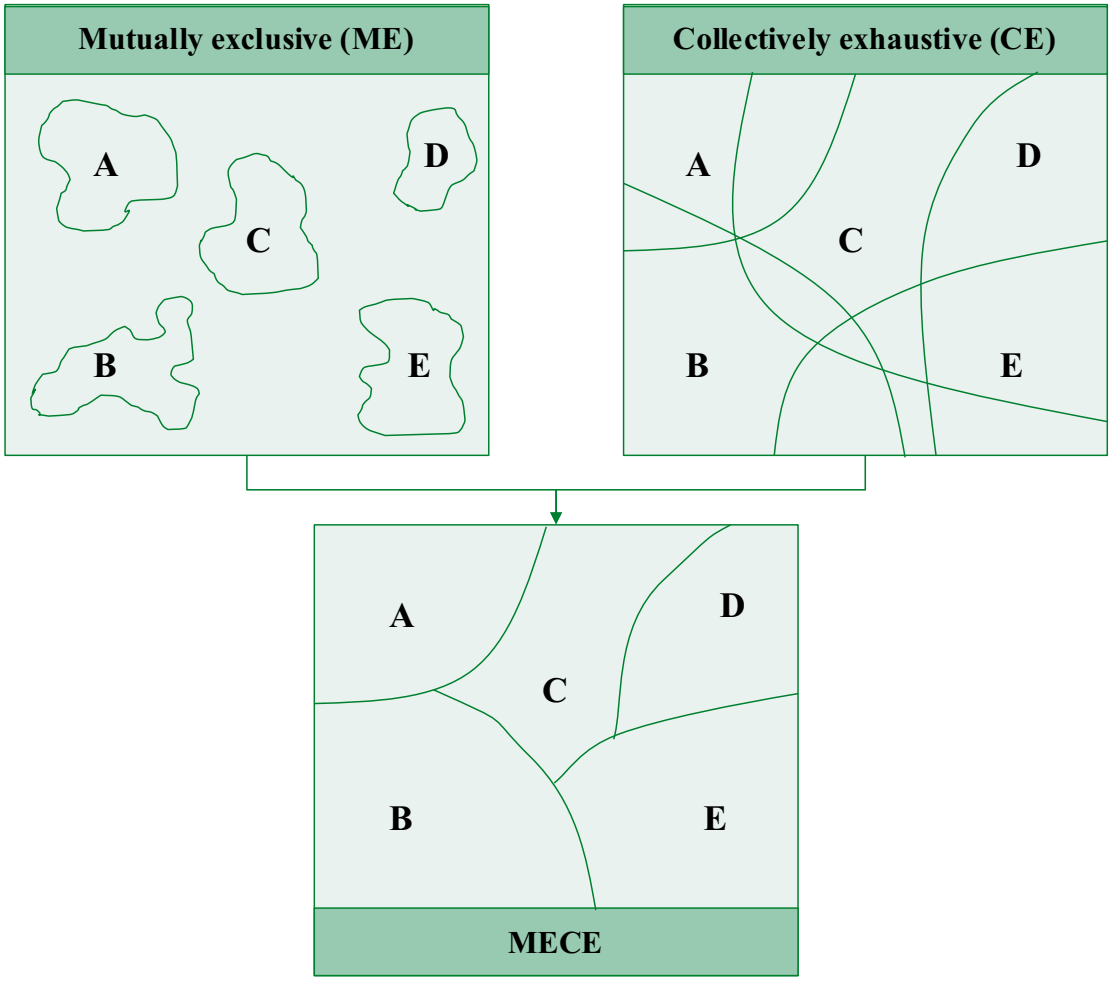


Fig. 18: MECE criteria according to Rasiel (1999), graphical representation by Lee & Chen (2018)

More detailed criteria are provided by Gregor (2006) who names usefulness, meaningful labels and groupings, clear categorization logic and categorization characteristics, completeness and exhaustiveness as crucial to evaluation. According to Gregor (2006, p. 624) these criteria determine the level of "contribution to knowledge". Table 5 presents a detailed evaluation of the proposed typology according to the criteria suggested by Rasiel (1999) and Gregor (2006).

Evaluation criterion	Comment	Evaluation
Mutually exclusive	All approaches/heuristics identified in the present qualitative dataset can be placed in **exactly one** of the quadrants.	✓
Collectively exhaustive/completeness	All heuristics identified in the dataset can be sorted into the proposed typology without leaving any doubtful cases.	✓
Usefulness	• Practice (see chap. 2.1): assessment of pricing competences, structured professionalization of price analysis, showing additional possibilities of pricing heuristics • Theory (see chap. 2.1): understanding of B2B practices, structured price analysis by combining several research streams, refining price-setting process models by taking effectuation theory into account	✓
Meaningful labels and grouping	The category labels and grouping were tested with fellow colleagues from marketing research and based on the specific cases in the underlying dataset. As they are intuitively understandable and each of the types can be found in the dataset, this can be taken as evidence for the meaningfulness of labels and groups.	✓
Clear categorization logic & characteristics	The axis of the typology is formed by constructs that have been operationalized from the literature (Chandler et al., 2011; Frese, 2014; Küpper, 2010). The categorization and the characteristics of the four types can be assessed through a clear sequence of questions referring to specific items.	✓

Table 5: Evaluation of the proposed typology according to the criteria suggested by Rasiel (1999) and Gregor (2006)

The evaluation confirms that the typology contributes to the research gap with regard to information behavior in pricing theory and leads to actionable recommendations for pricing practice. The presented typology specifies price analysis heuristics and conceptualizes their application in response to PRIDs. Thus, this research project converts empirical incidences from across industries into scientific knowledge on the information behavior of pricing managers. The results may be used as a basis for investigating information deficits in other corporate contexts, such as planning. A further fruitful line of research, which will be followed in this thesis (see chap. 8), regards the antecedents of the four heuristics.

One could argue that interviewees sometimes give biased answers due to social desirability (Jäger & Reinecke, 2009). In this case, pricing managers might sugarcoat their pricing practices in order to gain recognition. This point of critique can be rejected for the present sample by evidence from the dataset: Most of the interviews started with the pricing managers stating that their price management has several flaws and is probably not as good as that of other companies. This indicates that, instead of being overly confident, the pricing managers of this sample participated in the interviews with a self-conscious attitude in the attempt to learn from the exchange. Several managers ended the interview with questions such as:

"From your experience with other interviews, do you have one or two recommendations or hints on what we could learn from others? That would help us benefit from this interview as well." (Matthias)

To make sure that the pricing managers would not become reluctant to share information, the interviewer took two major measures: First, a friendly environment was created and it was made clear that the interview is an exchange without judgements and every information shared will be of help in the research. Furthermore, the interviewer reacted to such concerns by assuring them that most the other candidates before them had similar concerns, and that usually they were more professional in pricing than they knew. These measures were inspired by Jäger & Reinecke (2009), who advise interviewers to keep an open mind. According to them, a statement such as "No, we actually don't engage in marketing", should tell the interviewer "that the expert does not connect any action of their company with the term 'marketing'. Neither do they know what the interviewee regards as 'marketing', nor whether the company conducts measures that the interviewer would consider to be 'marketing'" (Jäger & Reinecke, 2009, p. 67). The same holds true for managers' expertise in pricing.

7.6. Summary and Main Propositions

This chapter identified four heuristics that pricing managers use when approaching alternative/substitutive information to cover a PRID: the market-based approach, the

statistical approach, the methodological approach, and the networking approach. These approaches differ along the two dimensions of market transparency and causation/effectuation. By proposing this typology, this chapter further conceptualized information behavior in price setting. This ultimately contributes to the understanding of B2B pricing practices (Iyer et al., 2015) and the research on the micro-foundations of pricing (Hinterhuber & Liozu, 2017).

The results of this research project show that market transparency and the information barriers that come with it are extrinsic factors. Pricing managers and their companies can take measures to overcome information barriers (see chap. 7.4), which are usually long-term projects that aim to manage and develop new information sources. Yet the second dimension is an intrinsic factor with regard to pricing managers. Effectuation theory introduces a dimension to price-setting models that can be directly influenced by pricing managers. Incorporating effectuation theory into the realm of price setting adds a dimension which accounts for time pressure, pressure to act and uncertainty of price-setting processes.

Controlling the effectuation dimension is crucial for managers in order to be able to switch flexibly between heuristics. Otherwise, the combination of current market transparency and the predominant logic determine which heuristic the pricing manager will be forced to apply.

Since pricing manager can determine which logics they apply, the following research project will attempt to shed light on this newly added dimension of price analysis: Firstly, the levels of causation and effectuation logics in a broader sample of pricing managers will provide insights on their usage in pricing practice. Secondly, the antecedents of both logics will be identified. And thirdly, a connection between heuristics and firm performance levels will be drawn.

Main Propositions

- The types of heuristics pricing managers apply in information analysis can be characterized along two dimensions: market transparency and causation/effectuation logics.
- In contrast to existing price-setting models, which are built on causal principles, price-setting processes should incorporate effectual principles as well.
- Due to the newly added dimension of effectuation, the volatility of information situations as well as the role of pressure are better reflected in pricing models.
- Pricing managers can and should be able to switch between price analysis heuristics, as this renders them more flexible and improves their ability to adapt to market situations.

- Switching can be more or less resource-intensive and costly. Therefore, pricing managers and/or their superiors should review the feasibility and appropriateness of switching measures.

8. Causal and Effectual Heuristics in Price Analysis: Drivers and Mediators

"[…] effectuation is a valid way for firms to gain positional advantages in an uncertain and difficult-to-predict environment. […] Effectuation is learnable (Read & Sarasvathy, 2005) and can be taught to employees by providing them with appropriate guidance on how to deal with unpredictable situations." (Wu, Liu, & Su, 2020, p. 91)

The previous chapters have shown that due to frequent PRIDs pricing managers are forced to deviate from established price-setting processes in order to attain alternative or substitutive information. These heuristics take uncertainty and pressure in price analysis (cf. chap. 6) into account. For this purpose, pricing managers operate under four different heuristics during price analysis. Whereas existing price-setting models are based on causation techniques, the heuristics add effectuation as a dimension to price analysis and thereby align price-setting models further with the reality of pricing practices. Since the effectuation dimension has been newly introduced to the realm of price analysis and is at the same time intrinsic to pricing managers, it is a driving force to shape price setting and its professionalization. Therefore, this chapter is dedicated to investigating the causation/effectuation dimension of price-setting heuristics. Three major questions determine the research of this chapter:

RQ7: To which degree are (combinations of) causation and effectuation applied in price analysis?

RQ8: What are the drivers of causal / effectual reasoning in price analysis?

RQ9: How does the application of causal and effectual logics in price analysis influence price and firm performance?

By addressing these research questions, this chapter further explores the connection between price setting, information behavior, and strategic management decision-making. Thus, this chapter answers the call for research on information acquisition in pricing (Achterberg et al., 2018) as well as the one on antecedents for the application of effectuation logic (Grégoire & Cherchem, 2020)

8.1. Theoretical Background

Effective price decision making and the relevance of price analysis have been discussed several times in this thesis and were addressed by many publications before (e.g., Achterberg et al., 2018; Dutta et al., 2003; Iyer et al., 2015; Rusetski, 2014). Nevertheless, the individual contribution of pricing managers to pricing professionalization and pricing success is still a realm of major research potential (Feurer et al., 2019; Hinterhuber & Liozu, 2017).

In this context “success” is measured by the degree of pricing capabilities (Liozu & Hinterhuber, 2013b, 2014). Based on the resource-based view, Barney (1991) found the so-called “capabilities” of a company to positively influence firm performance. Several years later, the profit lever "pricing" was also recognized as such a capability (cf. Dutta et al., 2003), which laid the grounds for the operationalization of the pricing capabilities (Liozu & Hinterhuber, 2013b, 2014). Using their scale, the pricing capabilities’ direct effect on firm performance, their applications within pricing, as well as the configurations in which pricing capabilities lead to corporate success could be demonstrated (Liozu & Hinterhuber, 2013b).

It is as yet unclear which factors foster pricing capabilities: "an understanding of the antecedents of pricing capabilities would improve our theoretical as well as our practical understanding of how firms can build and deploy idiosyncratic pricing capabilities" (Liozu & Hinterhuber, 2013b, p. 609). However, it was already found that information processes have a positive effect on firm performance (Ingenbleek, 2007a; Totzek & Alavi, 2010a) and information acquisition was added as one strategic capability of pricing (Achterberg et al., 2018).

Yet, in established literature the logics underlying information behavior in pricing were not yet investigated as an antecedent of pricing capabilities and are therefore still largely unexplored. By exploring the logics behind price analysis, this chapter contributes to the established theory on the role individual pricing managers play in corporate success as well as to the research stream of pricing professionalization. The results deepen our understanding of price-setting heuristics and provide the ground for professionalization in price analysis. Furthermore, the results add evidence to the alternative view on price-setting models established in previous chapters. And lastly, the results contribute to the connection of pricing and capability research, information behavior, and effectuation theory (cf. Fig. 19).

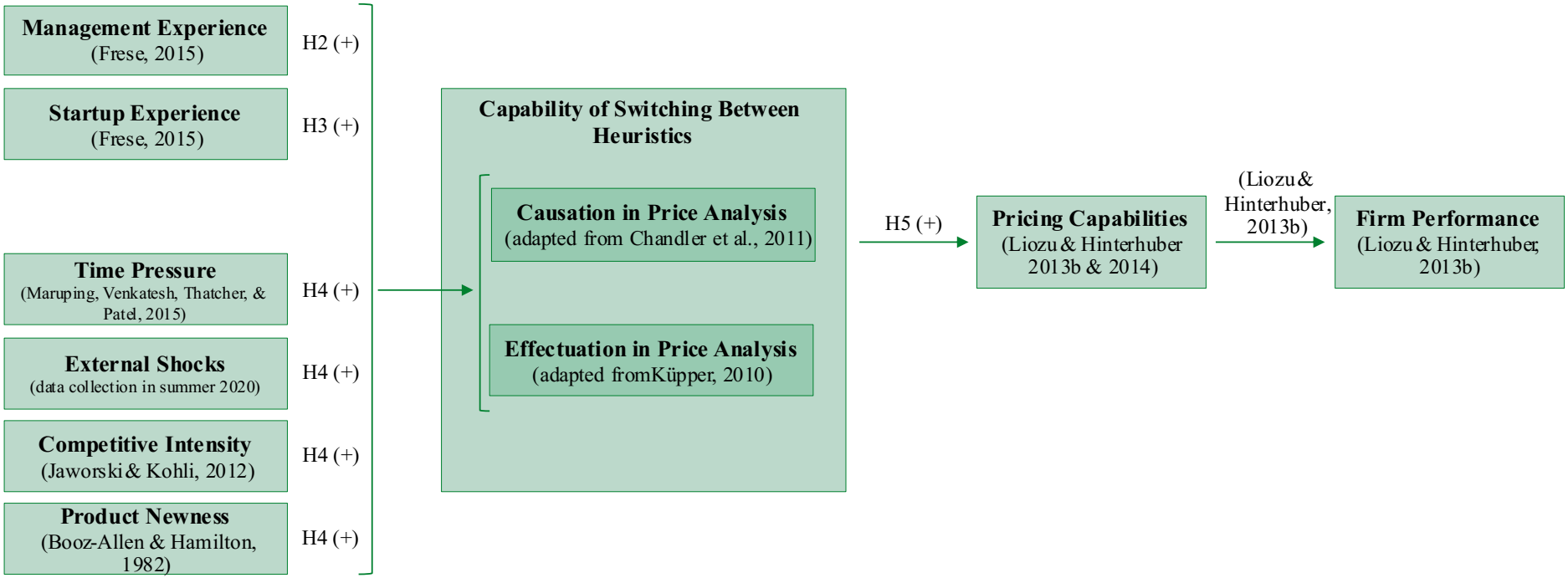


Fig. 19: Theoretical connections between causation, effectuation, pricing capabilities, and firm performance

8.2. Research Model and Hypotheses

Research on causal and effectual logics has established two major characteristics of both logics: Firstly, they are "integral parts of human reasoning" (Sarasvathy, 2001, p. 245). Secondly, with increasing experience managers "learn to balance causal and effectual approaches", which in entrepreneurial contexts eventually leads to a preference for effectual techniques (Read & Sarasvathy, 2005, p. 57). This results in this chapter's first and fundamental hypothesis which proposes that in pricing processes both logics are applied by managers.

H1: In price setting, the causation logic as well as the effectuation logic are applied during price analysis.

Ingenbleek (2007) conceptualizes experience as a prerequisite for information processing in pricing. Since the application of causal and effectual techniques can be learned, experience serves as an indicator of a learning process over time. More experienced managers are expected to be able to use information, e.g., market data, more efficiently as compared to colleagues with less experience (Van Bruggen et al., 2001). Thus, based on Read's and Sarasvathy's (2005) proposition it can be expected that with increasing levels of management experience, managers become more adept in also using effectual approaches in price analysis. Adding effectual techniques to their price analysis has, in turn, a positive effect on their pricing capabilities.

H2: Management experience positively influences the degree to which causation and effectuation logics are used.

Sarasvathy (2001) first found the use of effectual logic among expert entrepreneurs. On this basis, she established major differences between entrepreneurial thinking and classical management thinking. Thus, one could further deduce that start-up experience of managers has a positive effect on the degree to which effectuation logic is applied during price setting.

H3: Start-up experience positively influences the degree of effectuation logic used.

One central hypothesis evolved from the reflections with the Pricing Panel (cf. chap. 7): Pricing managers often start with causation-based heuristics (methodological and networking approach) and proceed to effectual heuristics (market-oriented and statistical approach) only if necessary (cf. chap. 7). Hence, if pressured to deliver results quickly and end the price-setting process for a product, a switch between heuristics might occur.

Resulting from the literature review and the qualitative research projects of this thesis (cf. chap. 4, 6, and 7), the most frequent reasons for pricing managers to experience pressure are tense competitive situations and situations of severe uncertainty, as well as

time constraints. Therefore, the constructs "competitive intensity", "time pressure" and the indication of external market shocks are used as proxy variables for pressure in price analysis. Durham, Locke, Poon, and McLeod (2000) argued that time pressure negatively affects a team's confidence in their own decisions and decreases their willingness to seek new information. In chapter 6 it was found that time pressure and the pressure to act are two major factors why pricing managers face PRIDs and have to spontaneously adapt their pricing processes. This contributes to the hypothesis that pressure in the pricing process and therefore limited resources, as Read and Sarasvathy (2005) would put it, enhance the use of effectual approaches. Innovativeness is known to be an indicator of uncertainty in management research (Blauth et al., 2014) and a moderator in the assessment of project success factors (e.g., Tatikonda & Montoya-Weiss, 2001). Uncertainty is here defined as the difference between information available to pricing managers and information required to take a pricing decision (Galbraith, 1977). Specifically, Brettel et al. (2012) found that the effects of causation and effectuation on project performance are also moderated by the innovativeness of the products. In this case uncertainty, or innovativeness, is another cause for pressure and is therefore expected to increase the use of effectuation techniques. Furthermore, it is expected to moderate the effect of causation/effectuation on pricing capabilities.

H4: Variables that indicate pressure in price analysis (e.g., time pressure, competitive intensity, uncertainty) positively influence the degree of effectuation logic used.

As described in the theoretical background of this study (subchapter 8.1), pricing capabilities are an established construct which can be used as a performance variable when measuring organizational pricing success. Since the previous findings of this thesis suggest that causal and effectual heuristics are applied in price analysis, it is hypothesized that the degree to which pricing managers apply both logics are antecedents of pricing capabilities.

H5: The degrees of causation and effectuation logics positively influence pricing capabilities.

Pricing capabilities, as well as managers' experience, are known to develop over time. H3 suggests that experience positively influences pricing capabilities. Yet, it is further hypothesized that the positive effect of management experience on pricing capabilities is translated through causal and effectual thinking in price analysis. In other words, management experience positively influences pricing managers' use of both causation and effectuation logics, which in turn leads to stronger pricing capabilities.

H6: Causation and effectuation logics mediate the effect of management experience on pricing capabilities.

Lastly, the typology of heuristics suggests that pricing managers are forced to use only one price-setting heuristic if they are constrained by the transparency of their market situation and the application of a specific logic. In order to become more flexible and able to adapt to situational challenges, pricing managers should master the dimension of causation / effectuation logics.

Hence, H7: Being able to move between causation- and effectuation-based heuristics is expected to be positively linked to pricing capabilities.

The research model in (Fig. 20) graphically summarizes the constructs this research project connects and the specific relationships that are investigated.

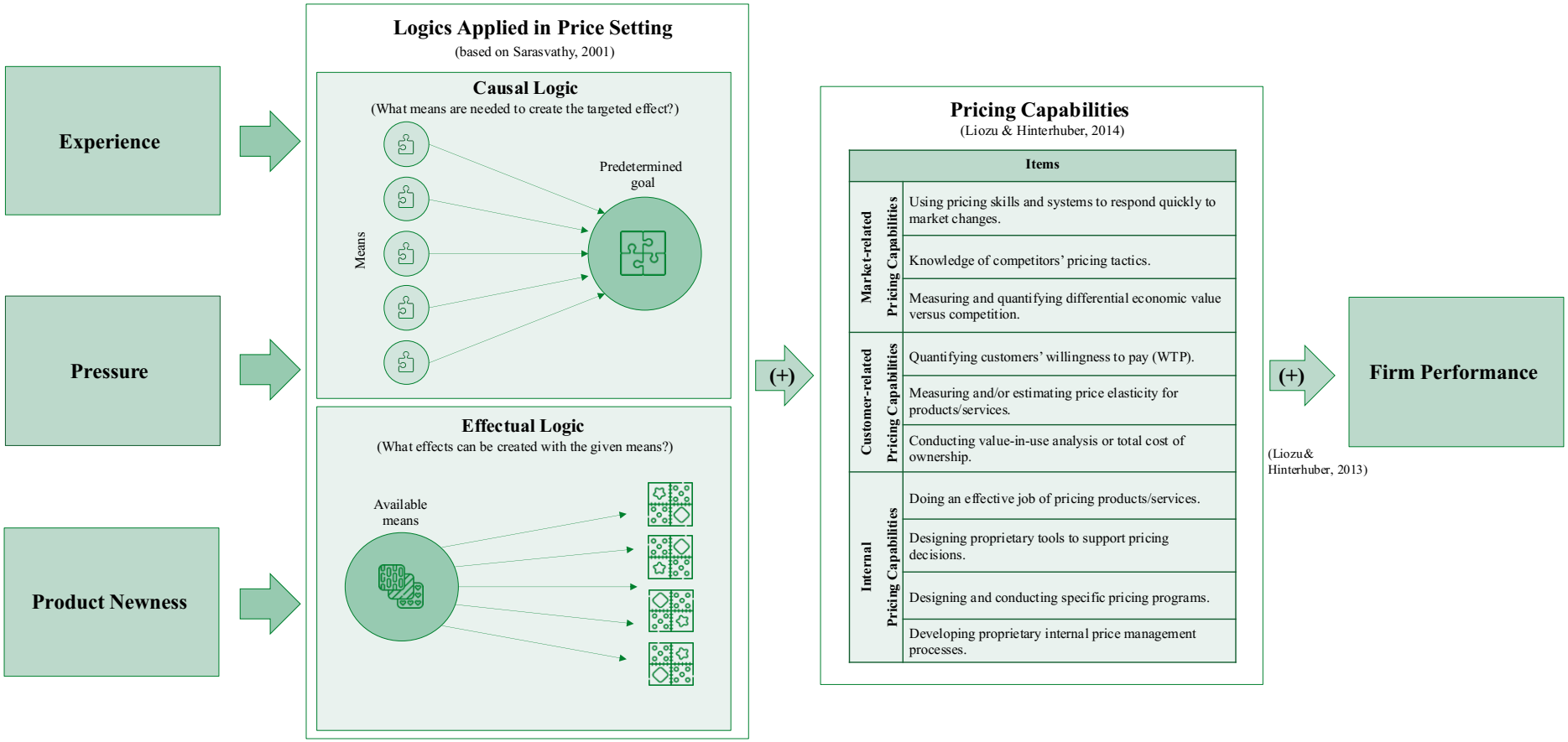


Fig. 20: Research model for causal and effectual logics as antecedents of pricing capabilities

8.3. Data Collection and Preparation

In pricing research, access barriers, data protection, and confidentiality obligations pose significant obstacles for data collection (cf. chap. 5). As a result, scientific knowledge of real-world price-setting practices is still sparse. With a sample of 118 pricing managers, this subchapter seeks to expand on this line of research by investigating their pricing situations, the logics underlying their price analysis, and the relationship between the logic used and their pricing capabilities and, ultimately, firm performance.

The data set was collected with a survey sent to pricing managers in 2020. The participants were recruited by spreading the survey in personal pricing networks and via the Pricing Panel.[3] Furthermore, the study was posted on the business platform LinkedIn in social media groups explicitly dedicated to pricing topics. Participants were incentivized only by the opportunity to participate in an exclusive presentation of the research results.

This approach led to a return rate of approximately 6 %, which is in line with the results in similar studies targeting executives (e.g., Blauth et al., 2014; Brettel et al., 2012; Liozu & Hinterhuber, 2013b). The dataset includes 74 initial variables (including single items of construct scales). Throughout the analysis the number of variables varies due to construct formation and variable combinations.

First of all, participants were asked to refer to one recent example of new product pricing in which they participated and answer the survey based on this specific experience. New product pricing is especially complex and uncertainty is higher than in other pricing scenarios (Dean, 1969; Monroe & Della Bitta, 1978). Furthermore, with new products pricing managers usually start with a "blank sheet" (Ingenbleek et al., 2013, p. 3). This means they have to go through a complete price-setting process instead of a mere adjustment of final prices.

This manner of data collection is based on common practice in pricing research (e.g., Rusetski, 2014). The initial control question ensured that the dataset comprises only managers actively involved in the price setting of a new product (see the Appendix I for the full questionnaire). After that, participants were presented with established 7-point-Likert-scales for the pricing capabilities construct (Liozu & Hinterhuber, 2014), effectuation theory (adapted to the price-setting context from Chandler et al., 2011; Küpper, 2010), as well as management and start-up experience (Frese, 2014). Finally, participants had to answer questions with regard to the circumstances of the specific price-setting process: product characteristics (such as innovativeness (Booz-Allen & Hamilton, 1982) and product advantage (Ingenbleek et al., 2013)), market

[3] This dataset was collected in collaboration with Nicolas Glaser who investigated decision making of pricing managers.

characteristics (such as competitive intensity (Jaworski & Kohli, 2012)), and company characteristics (e.g., size). Since Sarasvathy (2001) describes both causation and effectuation as integral parts of human thinking, which means that they can be applied simultaneously, both logics were measured independently of each other, as recommended by Brettel et al. (2012). This has the advantage that respondents are not forced to choose between both poles in the individual questions.

All constructs were tested for internal consistency using Cronbach's alpha, which resulted in acceptable values (the specific values for each construct are presented in the summary statistics in Table 6). Thus, the internal consistency of the scales of causation and effectuation that were adapted to the price-setting scenario was confirmed. Therefore, in the following analyses all constructs are used with their original number of items.

8.4. Methodology

To understand pricing practices and the interactions between its central variables in depth, a quantitative approach was chosen. The quantitative approach increases the level of external validity and helps to further deepen our understanding of the concepts and relationships discussed in previous chapters. Hence, the results will give indications on the relationships among variables and on how pricing realities are shaped. In order to ensure the reliability of research results, this study uses published scales for relevant constructs (cf. chap. 8.3). Thus, the scientific principles of comparability and replicability are ensured. All statistical analyses in this study were conducted with the software "R".

Simple group comparisons help to understand the relationships between pricing managers' logics in price setting and their other characteristics. These comparisons are calculated using analyses of variance (ANOVA) as well as multiple comparisons of means. The conditions for ANOVAs are tested using Levene's test for homoscedasticity and the Shapiro-Wilk test for normality. Moreover, Kruskal-Wallis rank sum tests are used to confirm the results even for heteroscedasticity or imperfect normality. Results from these analyses are presented in the following subchapter and in Fig. 28.

Further insights into relationships between causation and effectuation and their antecedents are generated through multiple regression models. For regression model building, tests of multicollinearity, the inclusion of dichotomous variables, as well as regression formulas with moderation and mediation effects are presented in the following paragraphs.

According to the Gauss-Markov theorem, the variables in a regression model should be independent. Multicollinearity is a problem as it makes it hard to distinguish the effects of single independent variables on the dependent variable. In order to avoid

multicollinearity, two separate tests are applied: firstly, a thorough correlation analysis shows direct relationships between two variables. Secondly, variance inflation factors (VIF) for each regression model determine the joint effects of predictors on a specific variable. In contrast to scatterplots and correlation analysis, VIFs are not limited to bivariate correlations but are able to detect multicollinearity originating from a group of independent variables. Generally, a VIF-value equal to or above 10 puts the statistical results of a model into question. Yet, in this thesis VIF values exceeding 4 are treated as doubtful. This is because a value of 4 corresponds to a related R^2 of 0.75 (caution: this is not the adjusted R^2 in the formula), which is considered relatively high.

$$VIF = \frac{1}{1 - R^2}$$

Equation 1: Formula for the variance inflation factor

The variables "market type", "company size" and "product type" indicate specific characteristics of the price-setting process and form mutually exclusive groups. Therefore, these variables are of a dichotomous nature. To interpret their effects in regression models in a meaningful way, it is necessary to form reference groups. Here, the reference groups in all regression model analyses are large companies in B2B environments which produce physical products.

The constructs used in this research project are all based on several-item scales, as discussed in the previous subchapters. It is standard practice in these lines of research to regard single-scale items as ordinal variables and multi-item scales as interval-scaled. An interpretation as interval-scaled variables is also supported by the way study participants perceive them: When answering the questions with regard to these scales, the answer space is represented as a scale, so participants usually perceive the single variables as intervals (Eckert & Ellenrieder, 2009). Therefore, they can be included in regression models as is frequently done in highly ranked publications (e.g., Feurer et al., 2019; Ghazimatin, Mooi, & Heide, 2020; Liozu & Hinterhuber, 2013b; Wu et al., 2020)

For hypothesis testing a multiple regression model of the following form is constructed:

$$Y_i = \beta_0 + \beta_i x_i + \varepsilon_i,$$

where i indicates the number of predictors which will be determined by modeling procedures.

Equation 2: Multiple regression model

The models of this chapter are developed according to the stepwise forward selection procedure. This means that the basic model includes only control variables and single independent variables are added to the model. In each step, that variable is added which

increases the power of the model (adj. R^2) by the biggest amount. This process is stopped when the remaining variables show no more significant effects on the dependent variable (i.e. causation/effectuation).

Next, the analyses of the relationships between predictors, price-setting logics, and pricing capabilities include moderation and mediation effect testing. Firstly, the regression models are tested for moderation effects, as the predictors of effectuation and causation are likely to interact. Hence, moderations of one independent variable by the effect of another variable are tested with the previously established regression model. Regression models with interaction terms take the following form:

$$Y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_1 x_1 \times \beta_2 x_2 + \varepsilon_i$$

Equation 3: Multiple regression with interaction term

Graphically, the interaction term can be represented as a moderator of two regressors on the dependent variable (Fig. 21). In the following regression models the moderation analyses capture the joint effects of variables indicating pressure. Secondly, mediation effects are tested using regression techniques according to Baron & Kenny (1986) and Hayes (2009, 2017). In comparison to moderation effects, mediators do not directly influence the effect of one independent variable on the dependent variable. Mediators rather translate the effect from X onto Y (see Fig. 22).

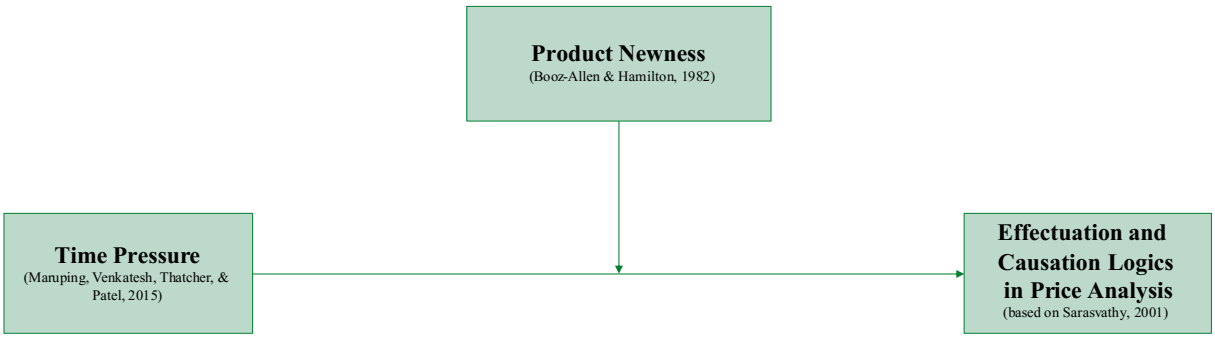


Fig. 21: Exemplary interaction effect of two pressure producing variables in price analysis

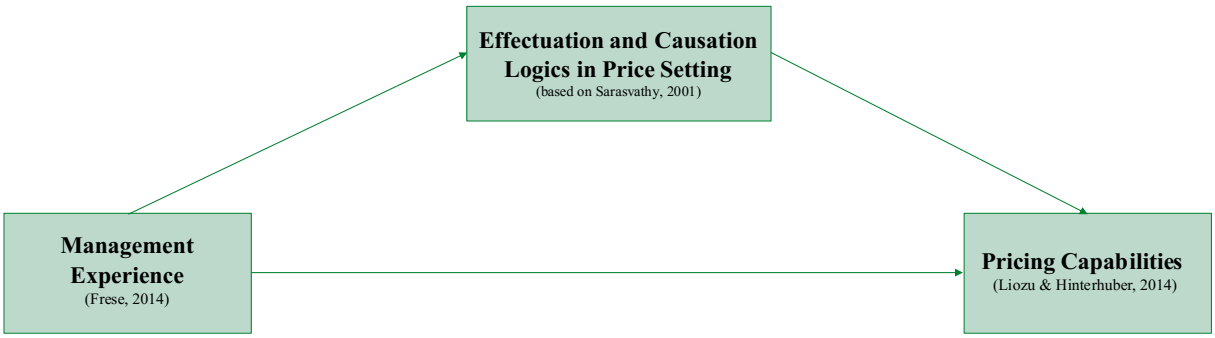


Fig. 22: Mediation effect of causal and effectual reasoning on pricing capabilities (H6)

8.5. The Pricing Situation – Descriptive and Summary Statistics

In order to learn more about the study participants, this subchapter presents descriptive statistics as well as summary statistics from the present dataset. After selecting only pricing managers directly involved in the pricing of a new product, 109 complete cases remain for analysis.

Descriptive statistics (Fig. 23) show that the majority (45%) of pricing managers in this sample referred to a pricing situation in the B2B area while answering the survey. When the pricing situations in hybrid business areas are added, almost 70% of the participants referred to a scenario in direct or indirect relation to B2B pricing. More than half of all participants referred to a pricing process within a large company, whereas other company sizes are represented with less than 20% each. The products they referred to while answering this survey differ. Almost two thirds referred to physical products rather than a service. While all managers referred to the pricing process of a new product, their products show different levels of newness: products that are familiar to the market but new to the company (e.g., new product lines) represent the largest group (42%). The group of real innovations (products new to the market and new to the company) is represented with only a few percentage points less (35%). Products new to the market but familiar to the company (e.g., repositioning) were used as scenarios by 13% of the participants. The remaining 10% used a new product scenario in which the product exists

on the market and is not entirely new to the company either (e.g., addition or improvements of existing products). These descriptive statistics give a first impression of the pricing situations the managers referred to when answering the survey on their price analysis processes.

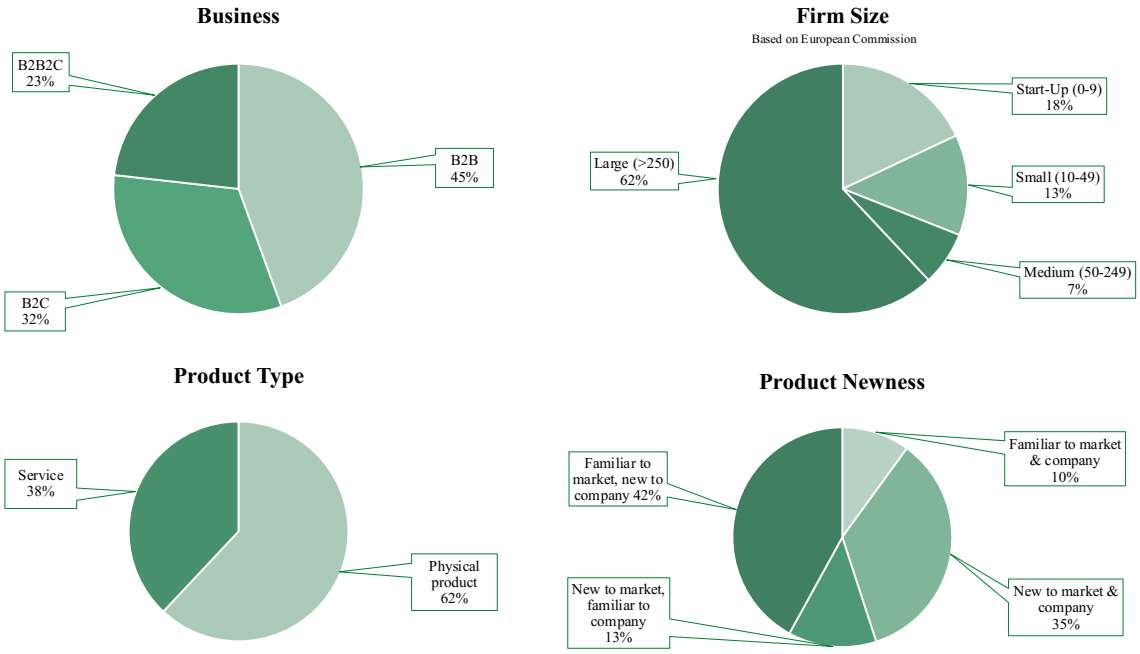


Fig. 23: Descriptive statistics of the respondents in the survey (n=109)

After this first impression of the pricing situations, the constructs of causation/effectuation, their potential antecedents, as well as the performance variable "pricing capabilities" are presented with their summary statistics (Table 6). It is interesting that these constructs only rarely result in levels below the theoretical mean. Only the means of start-up experience and one component of effectuation ("affordable loss") are quite low on average. One explanation could be that pricing managers in medium-sized or large companies are usually not recruited from start-ups; pricing careers rather develop within medium-sized or large companies. Furthermore, interviewees from previous studies mentioned that many start-ups, small, and medium-sized companies cannot afford the position of a price manager.

The summary statistics of the construct of pricing capabilities suggest that capabilities in relation to customers are lowest on average. This can be explained by the fact that information on and from customers can be unreliable and is therefore not easy to handle (Kienzler, 2018, p. 89; Schmutz & Reinecke, 2020, p. 71). One could argue that the low customer-related pricing capabilities are due to the large proportion of B2B companies in the sample, which traditionally have less contact to customers (cf. chap. 4.1). Seen in

light of Liozu and Hinterhuber's (2013b) argument that pricing practices have the power to increase firm performance regardless of industry or geography, this argument seems irrelevant. Rather, the low average indicates challenges in customer-related pricing skills. Hence, this result hints at a relatively strong potential for professionalization in customer-related pricing capabilities across industries.

Lastly, pricing managers in this sample estimated their use of causation logic (4.82) as on average higher than their use of effectuation logic (4.33). This gives a first indication with regard to the application of both logics (H1): both are applied to a degree that is not negligible but causation seems to be the predominant logic in price setting. This indicates that the Pricing Panel was right to assume causation to be the standard logic and effectuation the one used only when pressured (H4).

The application of causation and effectuation logics in price analysis is further investigated in the following subchapter.

Variable Name	No. of observations	Type	No. of items	Median	Mean	Min.	Max.	St. Dev.	Cronbach's Alpha
Pricing Capabilities	109	Items ord., construct interv. scale (7-point Likert scale)	10	5.0	4.82	1.92	6.83	0.91	0.88
Capabilities (company)	109		4	5.0	4.91	1.00	7.00	1.16	0.8
Capabilities (market)	109		3	5.0	4.94	2.25	7.00	0.98	0.76
Capabilities (customer)	109		3	4.5	4.62	2.25	6.75	1.01	0.66
Product Advantage	109		4	5.25	5.39	3.50	7.00	0.87	0.83
Competitive Intensity	109		6	4.50	4.44	1.17	6.67	1.12	0.73
Start-Up Experience	109		3	2.67	3.15	1.00	7.00	1.56	0.76
Management Experience	109		3	5.0	5.01	1.00	7.00	1.41	0.85
Time Pressure	109		4	4.25	4.26	1.00	7.00	1.51	0.88
Causation	109		7	4.56	4.82	1.43	7.00	1.1	0.83
Effectuation	109		17	4.34	4.33	1.00	6.50	0.85	0.8
Effectuation (BH)	109		4	5.25	5.18	1.00	7.00	1.23	0.85
Effectuation (AL)	109		3	4.0	3.86	1.00	7.00	1.39	0.79
Effectuation (CQ)	109		2	4.0	4.18	1.00	7.00	1.63	0.73
Effectuation (LE)	109		3	4.33	4.26	1.00	7.00	1.20	0.55
Effectuation (PP)	109		5	4.20	4.17	1.00	7.00	1.24	0.74

Table 6: Summary statistics of constructs

Empirical Evidence of Causation and Effectuation in New Product Pricing

The present dataset provides empirical evidence for the application of causation as well as effectuation logics in price setting. The first indication of this result was found in the summary statistics (Table 6), a second piece of evidence is provided by the tendencies towards one or the other logic (Fig. 24). The graph shows that across markets pricing managers in this sample tend to apply causal logics when pricing new products. They report their causal techniques to usually be stronger (i.e. higher values on a 7-point-Likert scale) than their effectual techniques in price setting. In accordance with the hypothesized difference between B2B and B2C, this sample shows that B2B and B2B2C pricing managers show stronger tendencies towards causal logics than their B2C colleagues.

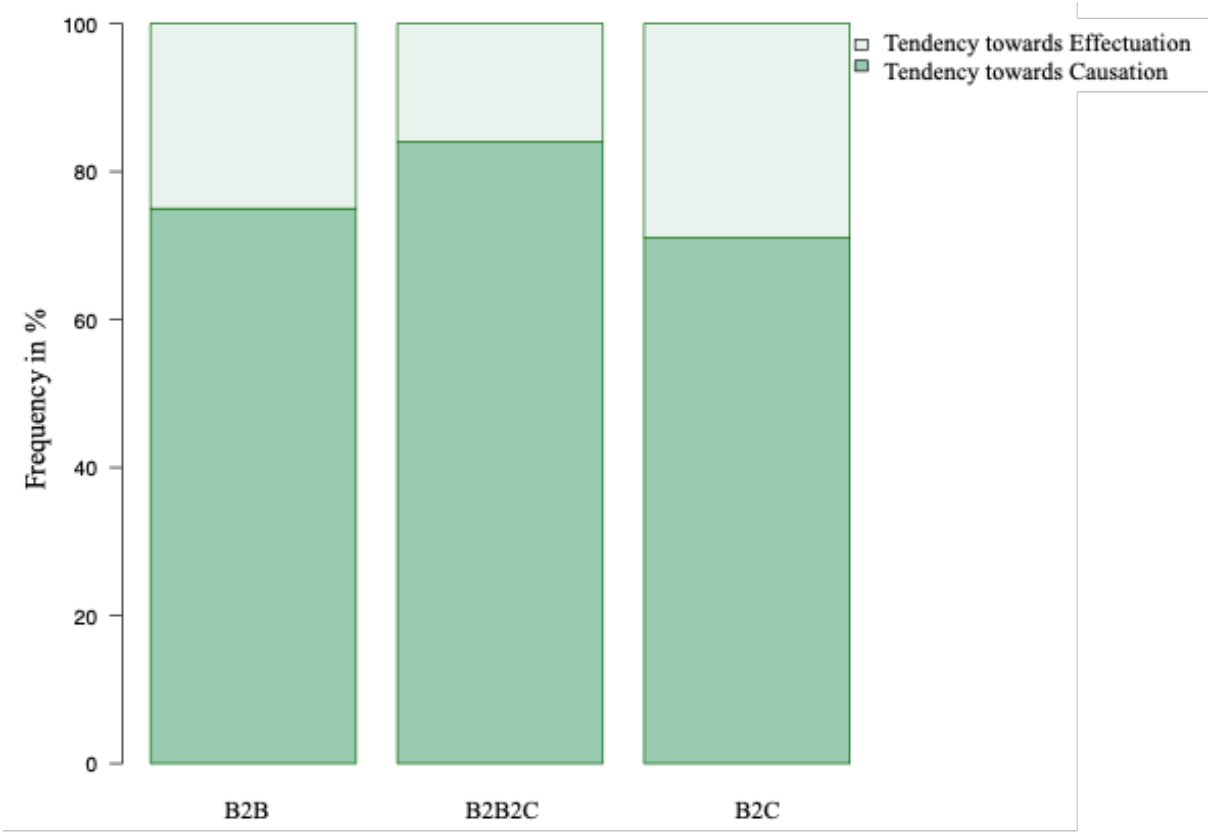


Fig. 24: Tendency towards causation or effectuation logic in price-setting

Investigating these tendencies in more detail further supports pricing managers' inclination towards causal thinking. When the single data points of causation and effectuation levels are plotted against each other (Fig. 25), it can be seen that the causation levels of pricing managers usually exceed their effectuation levels. The reverse combination

of high effectuation and low causation levels is not represented in this sample. Yet there are cases with mediocre skills in both logics as well as cases with low skills on both scales. Taken together, the data points depict a positive correlation between causation and effectuation logics. This observation suggests that both logics are usually developed hand in hand. As hypothesized (H2), this is one indication of an underlying learning mechanism fostering both logics in price analysis with increased experience.

In fact, 38 cases of the sample show a combination of both high causation and high effectuation levels (> 4.5). Following the concept of causation and effectuation logics being learnable, the points in the upper right-hand corner of the graph represent the most experienced pricing managers. In terms of the typology of heuristics, they would be the ones that are able to move along the horizontal axis (chap. 7). In other words, these pricing managers may be bound to the levels of market transparency but are still able to apply different kinds of heuristics in price analysis by changing their approach to information acquisition.

A pricing manager with low effectuation and high causation levels (lower right-hand corner in Fig. 25) would be forced to apply the market-oriented heuristic, which limits their chances of an informed price decision. In rather less transparent market situations, the same problem occurs with regard to the methodological and the networking heuristic. By switching between a causation and effectuation logic and using more than one type of heuristic, pricing managers are able to better adapt to market situations. This flexible information behavior gains in importance when analyzing the market transparency levels in this sample. In fact, the levels of transparency vary widely in both B2B and B2C markets. This indicates that the described switching behavior can become a crucial skill in price analysis, leading to better performing pricing managers (cf. chap. 8.8). Therefore, pricing managers with high causal and high effectual skill levels will here be called “supra-pricers” and their specific characteristics are further investigated in subchapter 8.9.

In conclusion, flexible information behavior – changing from causal to effectual approaches – can be considered favorable in terms of information acquisition. When pricing managers need to seek information for pricing decisions to bridge PRIDs, it is crucial that they are able to do what it takes in order to achieve a sound information basis. Since pricing situations are often characterized by obstacles, information deficits, and uncertainty, this flexible behavior of managers contributes to informed pricing decisions.

In summary, these results address the first research question of this chapter: *To which degree are (combinations of) causation and effectuation logic applied in price analysis?* It was found that real-world pricing practices involve not only causal but also effectual logics. These results strengthen the argument that existing price setting models miss a dimension (effectuation) that in fact plays an important role in pricing practice.

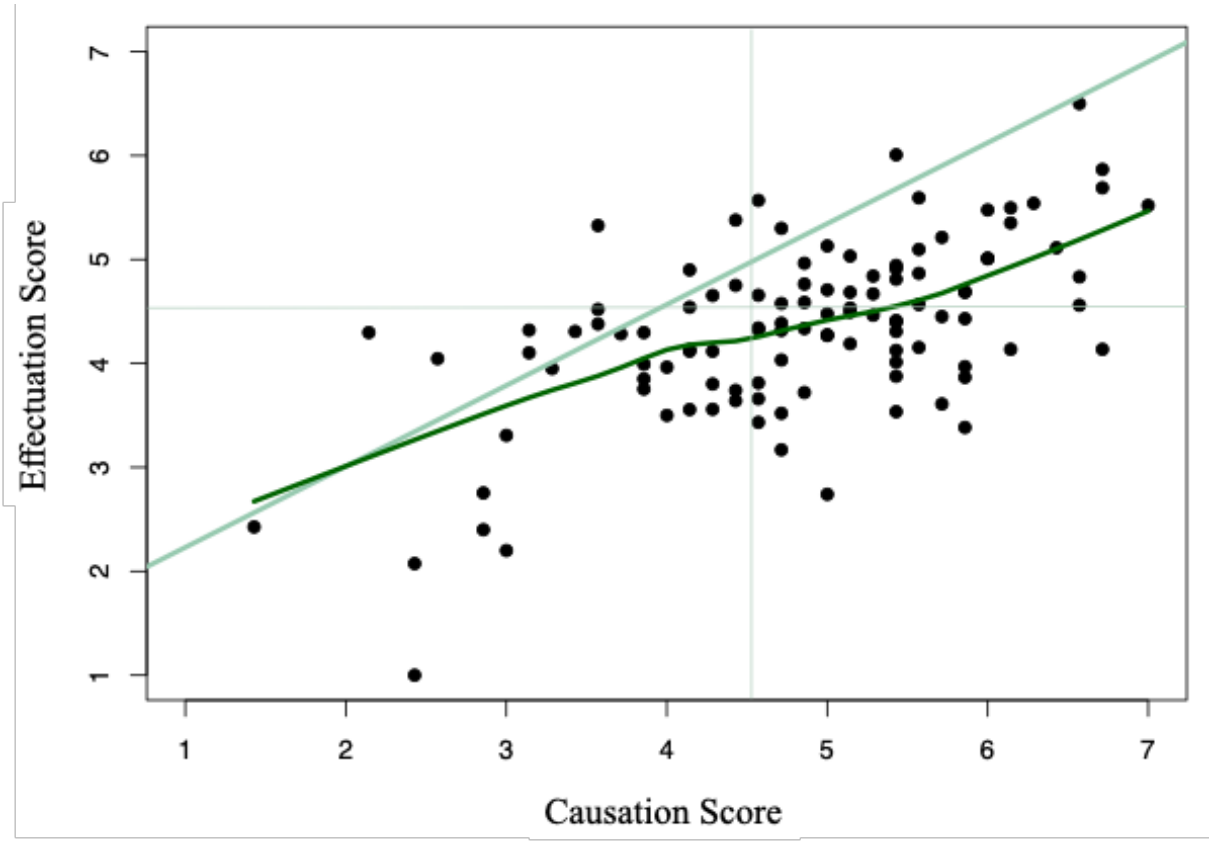


Fig. 25: Empirical evidence for causation and effectuation logics in price setting

8.6. Bivariate Relationships between Causation and Effectuation Logics, Pricing Capabilities, and their Predictors

Since the graphical representation of causation and effectuation logics indicated a positive correlation, this subchapter further investigates the bivariate relationships between these logics, pricing capabilities, and their predictors. Table 7 shows the bivariate correlation coefficients significant at a level of 0.05.

As hypothesized, causation and effectuation logics show a significant positive relationship to each other (.60). This supports the argument that they evolve simultaneously even though not proportionally. Moreover, both causation (.44) and effectuation (.47) logics are positively linked to management experience (H2). Hence, the more experienced managers are, the higher their ability to apply both causation and effectuation techniques. Together, these correlation coefficients confirm that causation and effectuation can be learned; being able to use both logics is a skill that develops over time.

Furthermore, all three variables – management experience (.46), causation (.7) and effectuation (.52) logics – show a significantly strong positive correlation with pricing capabilities (H5). Therefore, pricing capabilities increase with managers' levels of

experience, but also with their skill in applying causal and effectual techniques. Thus, it can be hypothesized that with increasing management experience, pricing managers learn about causal and effectual logics, thereby increasing their toolbox of pricing heuristics, which leads to stronger pricing capabilities. This hypothesis corresponds with a mediation effect of the two logics on the relationship between management experience and pricing capabilities (H6). Therefore, the upcoming subchapters will statistically evaluate this mediation model.

The variable reflecting start-up experience shows similar relationships to other variables as well. It is positively correlated with effectuation (.28), as hypothesized (H3) based on Sarasvathy's (2001) descriptions. However, it shows even stronger correlations with causation logic (.37). Actually, in the realm of price setting extensive start-up experience usually goes hand in hand with extensive management experience: 15% of pricing managers in the sample have vast experience in both fields, whereas 56% have only high management experience. Almost no cases can be found with wide start-up experience but no previous management experience (<5%). This distribution is equally calibrated across company sizes. Therefore, it seems as if start-up experience can be seen as a further type of experience which in the end contributes to the level of causation/effectuation logics in price setting and does not specifically influence effectuation levels.

Lastly, the variables indicating pressure in price-setting processes show stronger links to effectuation than they do to causation logic (H4), with some even showing no correlative connection at all. These results further support the hypothesis that causation techniques are the standard procedure for pricing managers, whereas effectuation is a logic pricing manager use to deviate from their planned process when circumstances become more difficult.

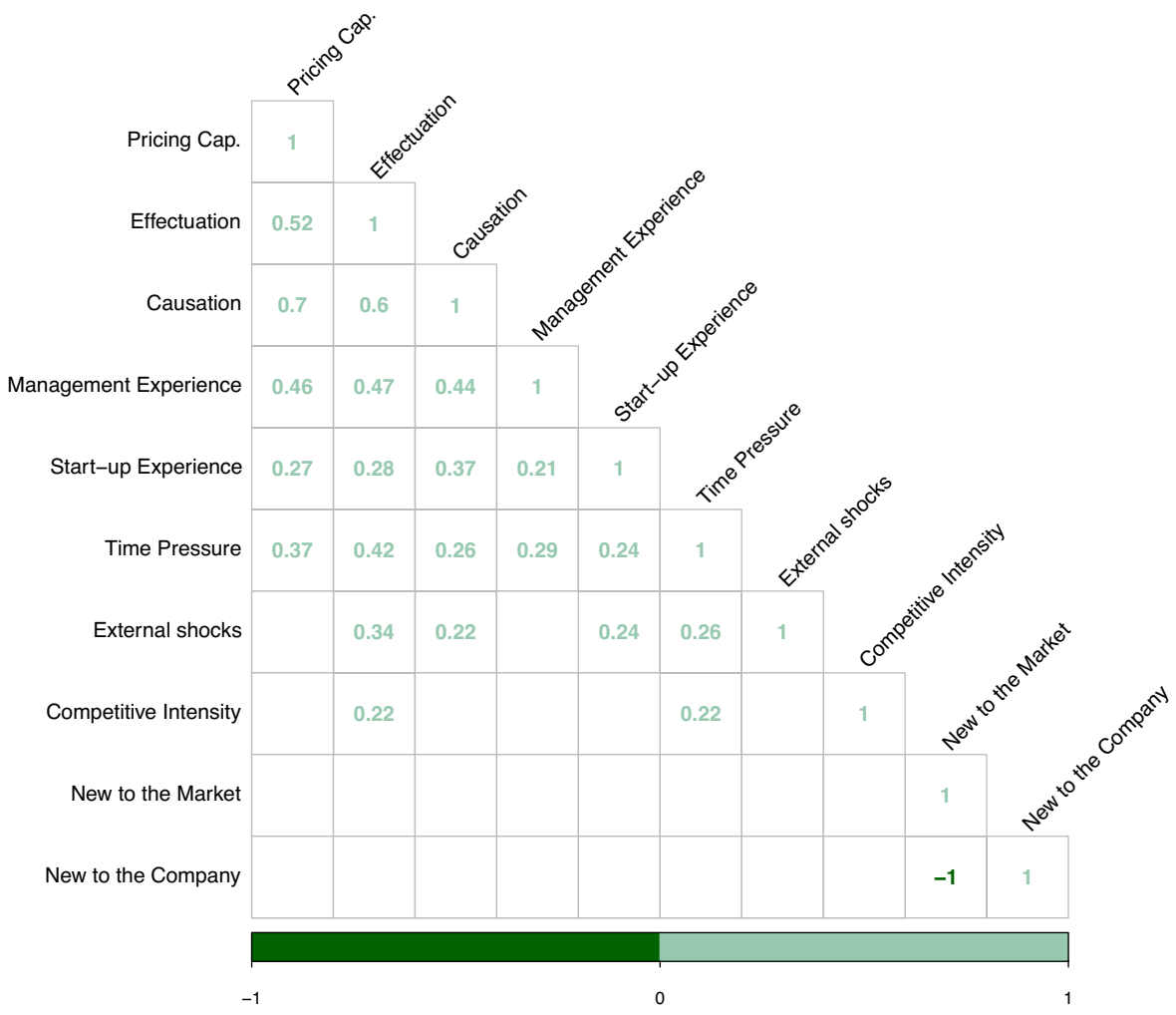


Table 7: Significant correlation coefficients at a significance level of p< 0.01 (output from R)

8.7. Drivers of Causation and Effectuation Logics

The results of the analyses of bivariate relationships in the interplay of pricing capabilities, causation/effectuation logics and predictor variables provide first indications on how these constructs are interlinked. This subchapter further investigates these relationships by adding causality through multiple regression models. In other words, in this subchapter variables driving causation and effectuation logics are investigated, which addresses the second research question of this chapter (RQ8).

First, the use and interpretation of multiple regression models are discussed. Afterwards, the regression results are presented and interpreted along the established theoretical foundations.

Some Technical Remarks on the Regression Models

First of all, the regressors do not show correlations which could potentially lead to multicollinearity problems in regression analyses. The significant correlations among predictor variables are all below 0.5 and therefore low enough to perform regression analyses without encountering severe multicollinearity problems. Of course, groups of dummy variables by definition show high correlations, which is the reason why regression models always just consider n–1 dummy variables. This means one of each group is left out to serve as the base group which the others are compared to (see chap. 8.4). This is true for all control variables, i.e. business size, market type (B2B, B2B2C, B2C) and product type. Here, large B2B companies with physical products are the base group. Furthermore, throughout the regression models the joint influence of independent variables (IVs) is tested in addition to bivariate multicollinearity problems. The calculated variance inflation factors (VIF), as described in chap. 8.4, turned out low enough to indicate no joint influence of IVs.

Secondly, the intercept of the following models mathematically refers to the case where X is equal to zero. With a majority of the variables measured on 7-point Likert scales, this case can occur only in a limited number of cases. Hence, the constant coefficient has no meaningful interpretation and reveals no further information on the relationships between independent variables and the dependent variable.

Thirdly, as demonstrated in descriptive statistics, this dataset includes pricing managers who differ with regard to market types (i.e. B2B, B2B2C, B2C), the product type their companies sell (i.e. service or physical product), as well as the size of their company. In order to make the results comparable and in line with the previous qualitative studies of this thesis, the following regression models control for their influences. This measure allows for transparency with regard to group differences and their respective significance.

The results (Table 8) show that most control variables turned out to be insignificant. This should be interpreted as no rejection of the null hypothesis, meaning that a group difference with regard to the dimension of causation/effectuation logic is unlikely. Only small companies and start-ups differ significantly from large companies in their levels of causation and effectuation logics. This means that the IVs in the respective regression models have a different influence in small companies and start-ups than they have in large companies: start-ups show lower levels of causation and effectuation logics than large companies, i.e. start-ups seem to build up experience more slowly than large companies do. However, small companies and start-ups exhibit a stronger driver for effectuation techniques than for causation techniques. In causation models, firm size is only slightly significant ($p<0.1$) and it is even insignificant in the final models.

Since the controls for market type (B2B, B2B2C, B2C) and product type (physical, service) are insignificant throughout the modelling process, the results are comparable with the findings from previous datasets that included only pricing managers from internationally active, medium/large companies selling mainly physical products in B2B/B2B2C markets. Consequently, the following subchapters will present the regression models based on the complete dataset. The results identify the drivers and facilitators of the horizontal typology dimension, i.e. causation/effectuation logics.

Drivers and Facilitators of the Causation Logic

The objective of the multiple regression models is to find the determinants that lead to pricing managers applying causation logic in price setting. This corresponds to an in-depth investigation of the second research question of this chapter: *What are drivers of causation / effectuation logics in price analysis?* Understanding the use of the causal logic will help to deduce implications regarding its facilitators. Therefore, the upcoming models test hypotheses formulated in subchapter 8.2. The stepwise modelling was performed as described in subchapter 8.4 and the complete documentation of the results can be found in Table 8.

The resulting model with the best fit (adj. $R^2 = 0.327$) is Model 5a.

$$Y_i = \beta_0 + \beta_1 management\ experience + \beta_2 startup\ experience + \beta_3\, product\ advantage + \beta_i controls + \varepsilon_i$$

Equation 4: Regression formula of Model 5a.

There were no significant interaction effects, which points towards a linear relationship between the predictors and causation logics (cf. Fig. 26). For all control variables the null hypothesis could not be rejected, which allows for the conclusion that their influences on causation are insignificant. In less technical words, the level of causation logics pricing managers report does not depend on their companies' sizes, market or product types. This suggests that causation is the primary logic in price analysis.

Management (.23) and start-up experience (.24) are found to have a strong influence on the level of causation logic of pricing managers (H2). Consequently, increasing experience of pricing managers leads to stronger causal skills and enables them to apply causation-based heuristics in price analysis. This is a rather confirmative finding and in line with previous results of this thesis as well as established literature where causation was frequently described as the decision logic used in classical management situations (e.g., Chandler et al., 2011; Sarasvathy, 2001; Wiltbank et al., 2009).

Lastly, the regression results show that pricing managers' level of causation logic depends on the products' competitive advantage (.24). Apparently, the perceived competitive advantage of a product has a positive effect on pricing managers' causal logics.

This is in line with the conceptualization of logics in price analysis because known competitive advantage is an indication of a strong market position and decreases uncertainty. Such situations are prone to the application of causal logics.

The overall competitive intensity turns out to be an insignificant predictor for causation logic, although it increases the overall model fit. Other variables indicating pressure, such as time pressure in price setting, do not show any significant influence either (H4). Together, the insignificant influences of pressure (time pressure, competitive intensity, external shocks) and product newness confirm that causation logic is applied in price-setting situations with low uncertainty (e.g., strong market position) or regular levels of pressure. Therefore, causation heuristics can be interpreted as a sort of baseline, a predictive approach to price analysis which does not depend on short-term interferences. In other words, they are applied in situations that form the basis for traditional price-setting models.

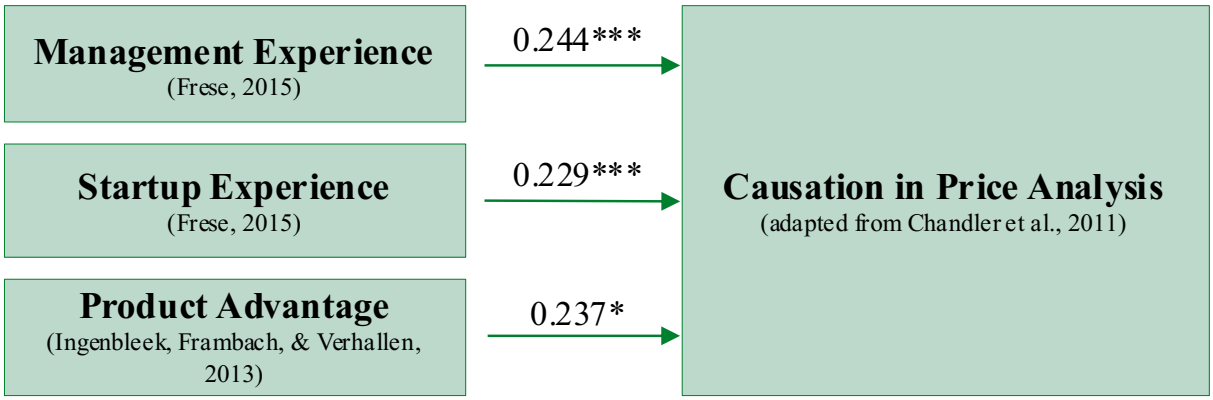


Fig. 26: Regression results of drivers of causation heuristics

Drivers and Facilitators of the Effectuation Logic

The influences of management and start-up experience are quite similar in the models that identify the drivers of effectuation logic (H2). Even though their effects are not as strong as they were in the causation models, they are still the most significant drivers. Hence, the level of experience increases managers' levels of effectuation logic. In other words, experienced managers apply both causation and effectuation logics in price setting. This finding is in line with previous marketing research indicating that experience determines the ability of managers to make use of information (Van Bruggen et al., 2001). Yet, in the effectuation models a series of other effects turns out to drive the application of said logic: variables indicating pressure and variables representing volatile pricing situations with high uncertainty (H4).

$$Y_i = \beta_0 + \beta_1 management\ experience + \beta_2 startup\ experience + \beta_3\ competitive\ intensity + \beta_4\ external\ shocks + \varepsilon_i$$

Equation 5: Regression formula of Model 5b.

$$Y_i = \beta_0 + \beta_1 management\ experience + \beta_2 startup\ experience + \beta_3\ time\ pressure\ x\ product\ newness + \beta_4\ product\ advantage\ x\ external\ shocks + \beta_5\ competitive\ intensity\ x\ external\ shocks + \varepsilon_i$$

Equation 6: Regression formula of Model 10b.

Firstly, the competitive intensity in a market situation as well as the external shocks during a pricing process positively influence the level of effectuation applied. Not only do these two variables directly influence effectuation logic, they also show a joint influence, i.e. an interaction. The joint interaction effect, however, is smaller than the sum of the individual effects. In terms of this model, this means that with an external shock present in the price-setting process of a product the influence of the competitive intensity on effectuation logic is reduced. Moreover, the presence of external shocks renders the product's competitive advantage a driver of effectuation logic. In summary, this means that the positive effect of product competitive advantage and competitive intensity on effectuation depends on the presence (or absence) of external shocks. This makes sense since external shocks are accelerators of uncertainty and volatility in a market situation. Therefore, they result in pressure in pricing processes as well. With this increased level of tension in price setting only a small portion of additional competitive intensity is enough to challenge pricing managers and pressure them into deviations from their planned processes. As argued before and also indicated by these regression results, variables indicating pressure result in higher levels of effectuation logic (H4).

Product competitive advantage, as a proxy for the reduction of uncertainty, is irrelevant to effectuation logic scores in general. Only in situations of external market shocks does it significantly increase effectuation scores. This means that even high levels of product competitive advantage cannot prevent the increased application of effectuation logic if the market situation is very uncertain. Product competitive advantage becomes a valuable card to play in pricing under non-predictive reasoning.

Secondly, and in line with the effects of other pressure creating variables, time pressure and product newness on the market have a direct positive effect on effectuation logic. In other words, with all other influences constant, time pressure increases the use of non-predictive logics in price setting. Similarly, if a product is a market innovation

(proxy for uncertainty; Blauth et al., 2014), this also positively influences the use of effectuation logics. However, the effect of time pressure on effectuation logics depends on the product's newness. In the case of pricing a market innovation, even smaller proportions of time pressure cause pricing managers to use effectuation techniques.

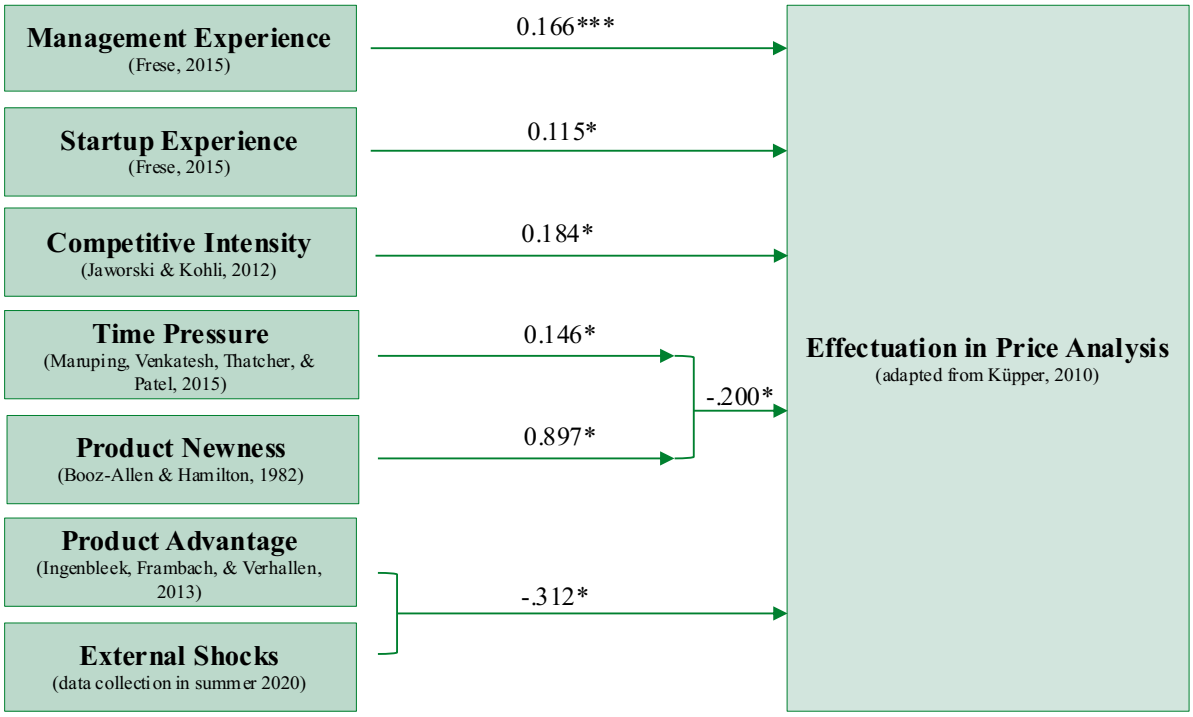


Fig. 27: Regression results regarding the drivers of effectuation logics

The direct effects in the linear regression models 1b–6b explain up to 41 percent of the variation in effectuation heuristics applied in price setting. When the models account for the three interaction effects (7b–10b), adj. R^2 increases up to 0.47.

In summary, in market situations in which pricing becomes even more difficult than normally, pricing managers tend to increase the use of effectuation heuristics in price setting, whereas the use of the causation logic stagnates. These specific situations are characterized by a tense competitive situation, external market shocks, time pressure and innovative products – and combinations of these characteristics. These results support the argument that in situations of pressure pricing managers add effectuation-based heuristics to causation-based heuristics in price analysis.

In other words, causation-based models of price-setting processes do not include the dimension of pressure. Yet, in real life pricing situations managers often (if not usually) operate under exactly such conditions. According to recent studies the majority of companies experience the effects of price pressure (Simon-Kucher & Partners, 2019, 2021). More than half of the 2210 companies in their sample report price pressure to be increasing on a yearly basis (Simon-Kucher & Partners, 2021). It can be expected that the

tension of pricing situations will not become any less stressful or pressuring in the future. Actually, even stable markets can be disrupted and become volatile and uncertain at any time (Read, Dew, et al., 2009). Therefore, adding this component to price-setting models is crucial for understanding pricing practices (Iyer et al., 2015) as well as the micro-foundations of pricing (Hinterhuber & Liozu, 2017). This is exactly what the effectuation dimension can do for price-setting models.

By identifying the drivers of causal and effectual logics in price setting, this subchapter addressed the second research question (RQ8): *What are the drivers of causal / effectual logics in price analysis?* The hypotheses on the influences of experience (H2, H3) and pressure (H4) on the two logics in price analysis were tested with multiple regression modelling. The following subchapters focus on the relationship between experience, logics and pricing professionalization (H5, H6). They address the last research question (RQ9) that asks *how causal and effectual logics in price analysis influence firm performance.*

	Drivers and Facilitators of Causation (a)						Drivers and Facilitators of Effectuation									
	Model 1a	**Model 2a**	**Model 3a**	**Model 4a**	**Model 5a**	**Model 6a**	**Model 1b**	**Model 2b**	**Mode l 3b**	**Model 4b**	**Model 5b**	**Model 6b**	**Model 7b (inter-action)**	**Model 8b (inter-action)**	**Model 9b (inter-action)**	**Model 10b (inter-action)**
Intercept	4.848*** (0.185)	3.944*** (0.245)	2.809*** (0.407)	1.736** (0.653)	0.996 (0.814)	0.994 (0.825)	4.443*** (0.133)	3.827*** (0.179)	3.048*** (0.298)	3.049*** 0.292	2.437*** 0.437	2.256*** 0.460	1.777*** (0.481)	3.011*** (0.682)	1.949*** (0.478)	2.092** (0.734)
Experi-ence Startup		0.328*** (0.066)	0.258*** (0.066)	0.225** (0.066)	0.229*** (0.066)	0.2288** (0.070)		0.224*** (0.048)	0.176*** (0.048)	0.147** 0.049	0.154** 0.048	0.136** 0.050	0.110* (0.050)	0.127* (0.050)	0.150** (0.050)	0.115* (0.050)
Experi-ence Manage-ment			0.245*** (0.072)	0.236** (0.071)	0.244*** (0.071)	0.244*** (0.071)			0.168** 0.053	0.169** 0.052	0.177*** 0.05104	0.173** 0.051	0.158** (0.050)	0.177*** (0.050)	0.177*** (0.050)	0.166*** (0.049)
Product Ad-vantage				0.225* (0.108)	0.237* (0.108)	0.236* (0.110)								-0.115 (0.097)		-0.062 (0.097)
Competi-tive In-tensity					0.143 (0.095)	0.142 (0.096)					0.128° 0.069	0.120° 0.069	0.130° (0.067)	0.110 (0.067)	0.201* (0.079)	0.184* (0.078)
External shocks										0.349* 0.151	0.329* 0.150	0.295° 0.151	0.298* (0.147)	-1.842* (0.819)	1.508* (0.622)	-0.446 (1.047)
Time Pressure						0.00192 (0.074)						0.065 0.053	0.200** (0.070)	0.054 (0.053)	0.047 (0.053)	0.146* (0.071)
Product new to the mar-ket													1.114** (0.401)			0.897* (0.400)

Time Pressure* new to the market													-0.252** (0.089)			-0.200* (0.089)
Product Advantage* External Shock														0.401** (0.151)		0.312* (0.150)
Competitive Intensity* External shock															-0.265* (0.132)	-0.200 (0.130)
Adj. R^2	0.0314	0.219	0.295	0.318	0.327	0.320	0.155	0.302	0.361	0.388	0.403	0.406	0.442	0.438	0.425	0.470
Control Variables	✓ startup significant	✓ Small/ startup significant	✓ Small/ startup significant	✓ Small/ startup significant	✓	✓	✓ startup significant	✓ Small/ startup significant	✓ Small/s tartup significant	✓ Small/ startup significant	✓ Small/ startup significant	✓ startup significant	✓	✓ startup significant	✓ Small/ startup significant	✓ startup significant
VIF	≤1.27	≤1.27	≤1.43	≤1.43	≤1.72	≤2.04	≤1.27	≤1.27	≤1.43	≤1.55	≤1.81	≤2.08	≤2.95	≤2.10	≤2.08	≤2.27

Significance codes of p-values: 0 '***' 0.001 '**' 0.01 '*' 0.05 '○' 0.1 ' '

Table 8: Regression results for the dimension causation/effectuation logics

8.8. The Connection between Causation and Effectuation Logics and Firm Performance

Pricing capabilities and pricing performance are known to have a positive influence on firm performance (Achterberg et al., 2018; Liozu, 2016; Liozu et al., 2021; Liozu & Hinterhuber, 2013b). Information acquisition, in turn, was found to be a "strategic pricing capability" and a "crucial prerequisite of successful pricing strategies" (Achterberg et al., 2018, p. 897). Therefore, professionalized information acquisition and analysis in pricing would lead to higher pricing capabilities, which then positively influence firm performance.

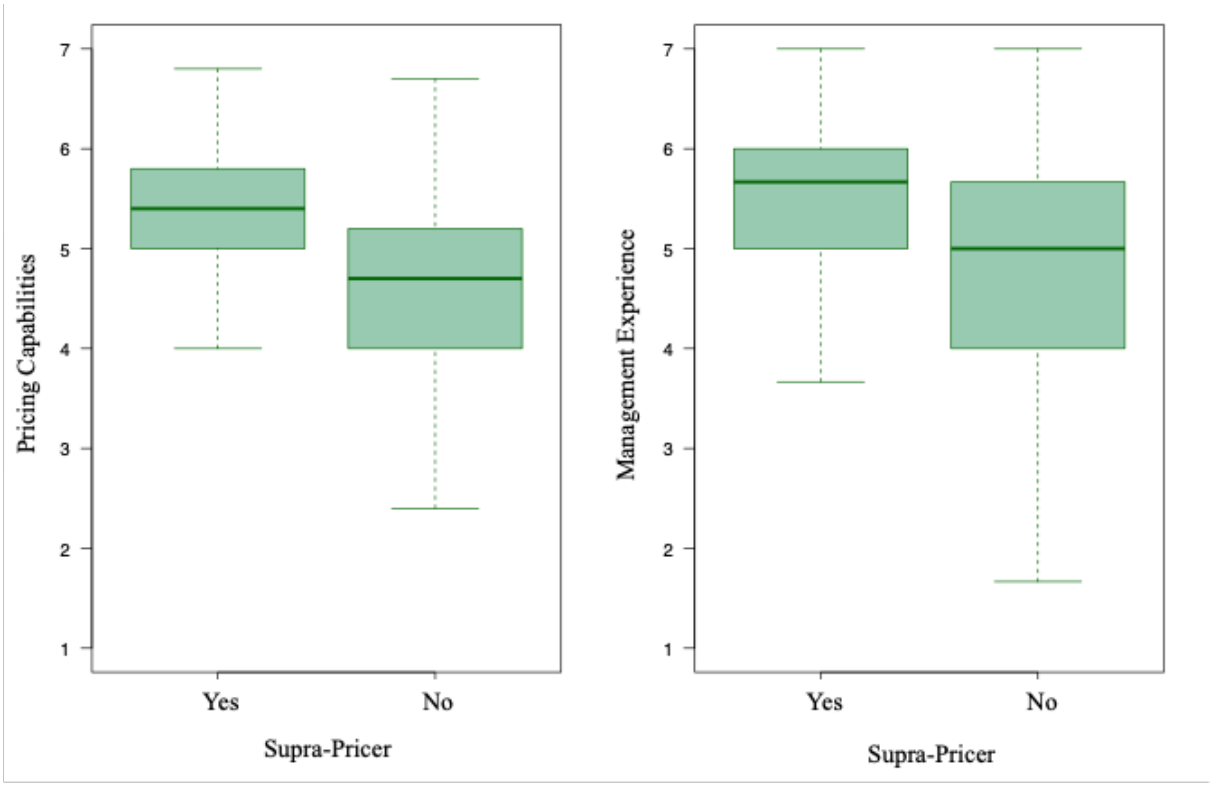
Following this line of reasoning, this chapter analyses causal and effectual reasoning in price analysis as a determinant of professional information acquisition and connects them to the construct of pricing capabilities. By drawing this connection, the results will help to identify ways in which causal and effectual logics in price analysis influence firm performance.

The results of correlation analyses (presented in subchap. 8.6) suggest that increases in both causation and effectuation logics are positively linked to pricing capabilities (H5). The finding that all three variables have the same direction of effects constitutes the first piece of evidence for this hypothesis. Regression analyses indicate that pricing managers who are able to apply both causation and effectuation logics can deviate from planned pricing processes in highly uncertain market situations. Thereby, these supra-pricers are able to professionally acquire information and develop a solid information basis, which is crucial to pricing capabilities.

In fact, when comparing supra-pricers to other pricing managers in the sample, they show significantly higher pricing capabilities (Fig. 28). In other words, the combination of high causation and high effectuation skills significantly differentiates pricing managers from their colleagues who use predominantly one logic only. This constitutes a second piece of evidence, since it indicates that applying both logics positively influences pricing capabilities (H5).

Supra-pricers do not only differ from their colleagues with regard to their increased pricing capabilities, but they also show significantly higher levels of management experience (Fig. 28). High levels of management experience, in fact, constitute a necessary (but not sufficient) precondition for belonging to the group of supra-pricers: Nearly all supra-pricers show a high level of management experience (17 out of 19), whereas some pricing managers operate with rather one-sided combinations of causation (47 out of 77) or effectuation (44 out of 77) logics despite high levels of experience. These results show that the role of management experience is central to the development of a company's pricing capabilities. In other words, the management experience of pricing

managers significantly influences not only their use of causation and effectuation but also their level of pricing capabilities.



Analysis Method	pricing capabilities (total)	Market related pricing capabilities	Organizational pricing capabilities	Customer related pricing capabilities	Product Advantage	Competitive Intensity	Management Experience
Group difference (ANOVA)	0.86***	0.82***	0.93**	0.8**	0.46*	0.58*	1.08**
Kruskal-Wallis rank sum test (Chi-squared)	14.27***	11.43***	11.77***	8.43**	4.52*	4.11*	10.2**

Fig. 28: Group differences (ANOVA) of supra-pricers with respect to other pricing managers

The extent to which said relationship between management experience and pricing capabilities exists directly or is mediated by causation and effectuation logics is shown by the results of a mediation analysis (H6). The results confirm full mediation (cf. Baron & Kenny, 1986) as well as a significant indirect effect (Hayes, 2009, 2017) of

experience on pricing capabilities via the combination of causation and effectuation heuristics. The regression coefficient between experience and pricing capabilities as well as the regression coefficient between the two logics and pricing capabilities are statistically significant ($p<0.01$). Using bootstrapping techniques, the moderation effect was calculated for 500 bootstrap samples and tested for significance. The indirect effect is (.63)*(.33) = 0.21 and is statistically significant ($p<0.001$), while the direct effect of experience on pricing capabilities is no longer statistically significant after accounting for the mediator (cf. Fig. 29).

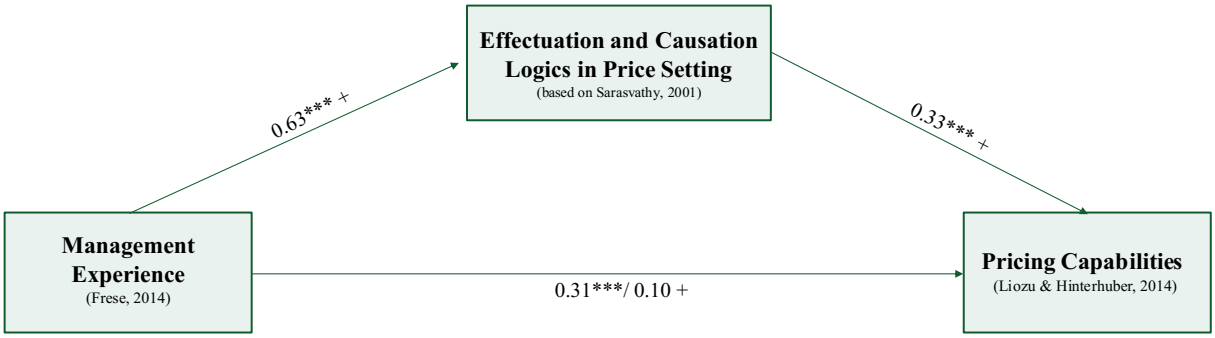


Fig. 29: Mediation effect of causation and effectuation logics (H6)

In summary, the results indicate a positive effect of management experience on pricing managers' pricing capabilities. Furthermore, the results show that the use of causation and effectuation logics is a necessary precondition for successful price management, as it allows management experience to exert its leverage on the pricing capabilities. In simpler words: the stronger both logics in price setting, the more successful the leverage effect of management experience on pricing capabilities – and therefore firm performance (cf. RQ9).

8.9. Discussion and Implications

Given that management experience is acquired through learning processes, successful pricing teams manage to improve causal and effectual techniques over time. The most professional pricing teams use the available management experience to strengthen causation and effectuation heuristics and thus develop their pricing capabilities significantly more strongly than other pricing managers. This professionalization enables such pricing teams to adapt flexibly to their environment, which is especially helpful in competitive market situations with low product comparability and high uncertainty.

Of course, the results also show that a focus on expanding pricing capabilities is less worthwhile for those companies that mainly offer well-comparable products with no significant advantages relative to their competitors in a rather transparent market. The

antecedents of pricing capabilities adequate for companies in such market situations are a worthwhile subject for future research. The knowledge built through the results of this research project, which indicates different levels of effectiveness of pricing capabilities, can support experimental settings in future research on pricing capabilities. Liozu et al. (2021) already made a first step in this field with their configurational analyses of companies' success factors. They found that in the absence of distinct pricing capabilities other combinations of prerequisites can also lead to corporate success. One successful configuration consists of the constructs "collective mindfulness" (i.e. active information processing) and "rationality" (i.e. conscious information processes), which compensate for strong pricing capabilities. Thus, in market situations as described above an expansion of these configurations or a focus on sales competencies would be more promising (e.g., Frenzen, Hansen, Krafft, Mantrala, & Schmidt, 2010) than building causal and effectual skillsets.

However, in an innovation-driven market, a market with several strong players, and/or a situation where even small product differences can result in strong market changes, the results of this chapter suggest a focus on professionalizing pricing centers (as suggested also by Dutta et al., 2003; Ingenbleek et al., 2003, 2013; Liozu & Hinterhuber, 2013a). In such market situations, companies benefit from developing their pricing managers to supra-pricers. Based on the findings of this chapter, the following measures can support this professionalization in pricing:

- **Actively strengthening thought patterns:** Since causal thinking poses less of a problem in price setting than effectuation logic does, managers of pricing units should not only allow but even encourage the development of effectuation logics. Especially during price analysis and decision preparation, pricing managers can be encouraged to apply effectuation techniques through an emphasis on their position of control (cf. Wiltbank et al., 2006). Moreover the ability to quickly compensate for mistakes in price analysis should be consciously integrated into price-setting processes (cf. Wiltbank et al., 2006).
  Furthermore, superiors of pricing managers should keep an open mind themselves and propagate a pricing culture interested in and inspired by new approaches. Hence, managers should create explicit spaces for resource-oriented and control-conscious processes (Brettel et al., 2012; Wiltbank et al., 2009). One possible way would be the integration of so-called "effectual cells" into the existing process structures (Brettel et al., 2012; Wiltbank et al., 2009). This extension of their normative and planned pricing processes would help pricing managers account for and quickly react to information needs.
- **Adjusting price-setting processes to the relevant degree of innovation:** The price-setting process should be adapted to the level of innovation of a product or a service (see Brettel et al., 2012; Küpper, 2010; Read, Dew, et al., 2009; Read,

Song, et al., 2009). First of all, with a higher degree of innovation the degree of uncertainty in price-setting situations increases. Since effectuation techniques are especially effective in situations of extreme uncertainty, a price-setting process of a highly innovative product should reflect the benefits of effectual price setting (cf. Fig. 15 in subchap. 7.2).

A supportive measure can be the focus on available resources (even if they are rare) and potential outcomes: In accordance with the findings from chapter 6, information maximization could harm price success because it produces an information set with mainly noise so the signal might get lost. Rather, the available reliable information sources the managers have experience with should be exploited.

Furthermore, completely new products need flexible and open consideration in price setting (while successor products usually achieve good results through short and pre-determined processes). The addition of the effectuation dimension in traditional price-setting models also implies the ability of companies to deviate from established processes and, more importantly, coming back to them whenever possible. This leads to an economic use of pricing managers' time, their resources as well as the question of information maximization vs. effectiveness (cf. chap. 6).

- **Level of entrepreneurial/management experience:** Contrary to the assumption that entrepreneurial experience is crucial to the development of pricing managers' effectuation techniques, supra-pricers did not stand out through their start-up experience. To the contrary, the entrepreneurs in the sample also possessed higher proficiency in causation than in effectuation techniques. This supports the extension of effectuation theory from an entrepreneurial context to the one of established companies (Brettel et al., 2012) in pricing as well as the assumption that it is rather the degree of innovation of a product that is decisive for the applied logics (cf. Feurer et al., 2019). Therefore, it is worthwhile to pay less attention to entrepreneurial experience and much more to the different levels of management experience in the composition of pricing teams. Including experienced managers in pricing centers demonstrably supports the learning process with regard to causation and effectuation logics and thereby increases pricing capabilities, which is beneficial to the whole firm.

In summary, the hypotheses formulated in the theoretical model in subchapter 8.2 were all tested with advanced statistical analyses (Table 9). Most expected relationships were supported, but some were supported only under certain conditions specified by the analyses. The results contribute to pricing theory in that they extend established price-setting models by adding another dimension, namely effectuation theory. This dimension is able to account for factors in real world pricing practices which have been widely neglected in traditional models: uncertainty, volatile market situations, time constraints and pressure. Furthermore, the results address the importance of understanding the

antecedents of pricing capabilities for professionalization in pricing as emphasized by Liozu and Hinterhuber (2013b). And finally, the findings help to understand information behavior in price setting. Thus, the results reported in this chapter help to understand price-setting heuristics and their situational applications.

No.	Hypothesis	Hypothesis supported
H1	*In price setting the causation logic as well as the effectuation logic are applied to prepare pricing decisions.*	**yes**
H2	*Management experience positively influences the degree of causation as well as effectuation logics.*	**yes**
H3	*Start-up experience positively influences the degree of effectuation logic.*	**partly**
H4	*Variables that indicate pressure (e.g., time pressure, external shocks, uncertainty) positively influence the degree of effectuation logic.*	**partly**
H5	*The degrees of causation and effectuation logics positively influence pricing capabilities.*	**yes**
H6	*Causation/effectuation logics mediate the effect of management experience on pricing capabilities.*	**yes**
H7	*Being able to move between causation- and effectuation-based heuristics is positively linked to pricing capabilities.*	**yes**

Table 9: Summary of the results regarding the hypotheses

8.10. Main Propositions

- Pricing managers apply both causal and effectual thinking in price analysis.
- Pricing managers tend towards causal reasoning and only deviate from their planned processes towards effectual reasoning when pressured. Sources of pressure can be time constraints, competitive intensity, or volatile market situations.
- Since switching between causal and effectual heuristics can be costly, companies have to determine whether they might profit from supra-pricers. Supra-pricers

are especially effective in highly competitive markets where products are innovative and differ with regard to competitors' products, and where uncertainty and pressure are high.

8.11. Lessons Learned

- Actively creating spaces in which pricing managers can openly discuss their methods and heuristics helps in two ways: Firstly, it prevents tacit and individual pricing rules that may get lost with the employees who invented them. Secondly, these spaces make the development of existing and the experimenting with new methods possible.
- Design thinking approaches, that start with prototypes and iteratively test them, represent one state-of-the-art technique to innovate such business processes. Pricing teams should make use of such process development techniques and jointly re-think their practices.
- Superiors should put importance on information acquisition as a strategic capability.
- Pricing managers should be encouraged to think about pricing in a goal-oriented but also in a resource-oriented and control-conscious way.

8.12. Summary and Interim Conclusion

The analyses in this chapter extend the understanding of the previously defined price-setting heuristics. The (vertical) dimension of market transparency and barriers to information access can often be superseded only in the long run and often are not within the direct control of pricing managers. Therefore, their dominant strategy for remaining flexible and efficient in pricing is to master the horizontal dimension of "causation and effectuation". The results of this chapter show that pricing managers predominantly tend towards causal reasoning and only apply effectual reasoning when pressured from the outside. Hence, pricing managers with high levels of causation and effectuation skills, i.e. supra-pricers, turned out to be significantly more professional and successful in price setting than their colleagues.

Moreover, the analyses defined that supra-pricers are most useful to companies in highly competitive, innovation-driven markets with a low identifiable diversity among products.

Finally, the results confirm previous research that suggests the two logics develop with experience over time and are learnable.

In conclusion, supra-pricers are valuable assets to a company, because they are efficient and successful pricers. What makes them more professional than their colleagues grounds i.a. in their flexibility to apply causation- as well as effectuation-based

heuristics – in other words, they are not bound to pre-defined goals or the economic principle. Yet it remains to be researched when and under which conditions pricing managers switch among heuristics, which factors trigger or hinder a switch of heuristics, and finally, how companies can enable their pricing team to master all four price-setting heuristics.

9. Causal and Effectual Heuristics – Pricing Managers' Barriers to Switching

"This requires an appropriate organization of information processing, a certain awareness on the pricing routines [...] and to some firms a strategic decision about the extent to which pricing is delegated to other channel members." (Ingenbleek, 2007, p. 453)

The last study of this thesis investigated the underlying dimensions of the heuristics in price setting (chap. 8) and answered the question when and why companies should foster the flexible switching among price-setting heuristics. Building on the previous findings, the understanding of how companies can successfully achieve switches in pricing heuristics will be deepened in the present chapter. Two research questions will be addressed:

RQ10: What are the barriers that pricing managers face when switching heuristics?

RQ11: Under which conditions do pricing managers decide not to switch?

Using the analyses of two experimental settings, the switching behavior and, more importantly, the barriers to switching between heuristics will be combined to derive practical implications for companies searching for professionalization in price setting. In other words, this chapter shows, how companies can support their pricing teams to utilize all available heuristics without circumventing the necessary stopping rules.

9.1. Theoretical Background and Research Design

As has been determined in the previous chapter (chap. 8), switching between heuristics is a favorable behavior in terms of firm performance. Therefore, in most cases it is advisable for companies to encourage switching between heuristics in order to attain a reliable information basis. An analysis of the cases in which switching is not favorable and what companies should focus on instead is provided in chapter 8. Thus, it can be expected that pricing managers usually decide to apply at least one further type of heuristics to render their information set more reliable.

H8: Pricing managers are inclined to apply more than one type of heuristic, hence, switch to another heuristic after the first one, to address the present PRID.

The present research design draws upon several challenges established in pricing literature: on the one hand, the specific barriers pricing managers have to cope with while switching between price-setting heuristics, and on the other hand, the established constructs of pricing organization which shed light on the conditions under which pricing managers operate while applying price-setting heuristics.

The barriers relevant for supra-pricer behavior were based on three general aspects that were found to be related to the application of heuristics: pricing skills (Liozu & Hinterhuber, 2013b), the Price Relevance Model (PRM) (chap. 6) and pricing culture (Lancioni, 2005; Lancioni et al., 2005). Table 10Table 10: Specific barriers to switching between heuristics

indicates from which specific aspect each barrier or challenge was derived.

No.	Challenge	Pricing skills	PRM	Pricing culture
CH1	*We do not have the proper skills to conduct such measures.*	x		
CH2	*We are usually not able to react that fast to changes.*	x		
CH3	*We cannot count on the (ad hoc) support of other departments.*			x
CH4	*We do not have the proper tools to conduct such measures.*	x		
CH5	*The probability of positive effects of additional measures is too small.*		x	
CH6	*We have difficulties calculating the economic value of our product versus the competition.*	x		
CH7	*For new product prices we usually use external counsel.*	x		
CH8	*This additional action is not normally included in our internal pricing processes.*			x
CH9	*We do not have the authority to change the related processes.*			x
CH10	*This additional information will not be valued by decision takers.*		x	
CH11	*Such additional measures are a strategic decision, not an operative pricing decision.*			x
CH12	*I have no clear vision of the information need.*		x	x
CH13	*We don't have time to experiment.*	x	x	x

Table 10: Specific barriers to switching between heuristics

Thus, it can be hypothesized that pricing managers' information behavior is influenced by the just identified challenges (H9-11).

H9: Challenges arising from a lack of pricing skills negatively influence the decision to switch between heuristics.

H10: The stopping mechanisms found in the Price Relevance Model negatively influence the decision to switch between heuristics.

H11: Challenges coming from the pricing culture negatively influence the decision to switch between heuristics.

Under certain organizational conditions switching between heuristics can be more or less difficult. It is important that the pricing organization is open to goal- as well as resource-oriented methods, i.e. causal and effectual approaches, that companies are able to work in accordance with the maximal and the minimal economic principle or even regardless of predefined goals. Therefore, organizational antecedents are expected to exert an influence on the pricing performance.

Following Burkert et al. (2017), this research project hypothesizes that pricing process adaptability, centralization, top management involvement, and formalization influence the degree to which pricing managers can and are able to implement further measures in price setting. All these factors reflect aspects of the level of authority pricing managers exert over the pricing process and the respective organizational circumstances.

H12: The degree of authority pricing managers hold in the pricing process influences their switching behavior.

9.2. Data Collection and Sample

Since access to managers in pricing is quite challenging and collecting (large) datasets in the field is made difficult by access barriers, data protection, and confidentiality obligations. Several measures were taken to overcome these challenges: First, participants were incentivized by a 5 CHF donation to the charity "Winterhilfe St. Gallen" for every completed questionnaire. Second, the survey was distributed through existing and well-functioning networks (specifically the Management Pool of the University of St. Gallen and the Pricing Panel presented in chap. 5). Third, the anonymity of responses was guaranteed by asking the participants to send contact details (e.g., for the invitation to the presentation of results) separately via e-mail and not within the survey.

With the help of these measures a dataset of 266 pricing managers was collected, which corresponds to a response rate of 27% of all relevant contacts and ca. 4% of the Management Pool addresses. The survey was created with the software Unipark and sent out in January 2021 (for the full questionnaire refer to Appendix I).

First of all, participants had to indicate their position with regard to the pricing function of their company, i.e. a direct/indirect relationship, active/passive function. After that, the first section of the survey started with general control questions: phases of the pricing process the managers are involved in (cf. chap. 4.3), market type (B2B, B2C, B2B2C), product type (physical product, service), management level, competitive intensity (Jaworski & Kohli, 2012), previous management/start-up experience, number of employees, country.

The second part of the survey covered questions with regard to the pricing organization and the pricing function. Formalization, centralization, specialization, top-management involvement, and pricing process adaptability were measured on 7-point Likert scales adapted from their original version to price setting by Burkert et al. (2017). Finally, participants had to indicate the importance posed on innovativeness in their company's culture (Webster, 1993).

In the third and last part the participants were presented with two price-setting scenarios interrupted by an attention test. Both scenarios describe a situation in which one heuristic has already been successfully applied and the chance to apply a second one presents itself (Fig. 30 and 31). The specifics of the two scenarios were synthesized from real-world pricing situations managers had described during the qualitative studies of this thesis (cf. chap. 6 and 7). There it was found, that switches can occur in both directions and the focus group discussion emphasized that switches in both directions are crucial to the professionalization of their information behavior. The experimental setting of both scenarios is in line with and inspired by managerial decision research based on scenarios (e.g., Rusetski, 2014). Following Rusetski's example, "although the scenarios were hypothetical, the survey asked respondents to make their decisions in the context of their actual brands and actual competitors" (2014, p. 1735).

Scenario 1 describes a situation where the PRID consists of competitors' prices. A networking heuristic had already been applied and this is now the chance to switch to a methodological price-setting heuristic. In terms of the underlying logics, this switch would imply complementing an effectual heuristic with a causal heuristic.

Scenario 2 describes a situation of a PRID with regard to customers' willingness-to-pay (WTP). The pricing manager in the scenario has already applied a market-oriented heuristic and could now switch to a statistical heuristic in order to further approach the PRID. This implies switching from a causation-based to an effectuation-based heuristic.

Both scenarios are presented in a way that switching would improve pricing performance (based on the findings from chap. 8). Scenario 1 describes a non-transparent market situation, which in terms of the typology of pricing heuristics represents the lower two quadrants. Scenario 2 relates to a market where access to information is less problematic, which corresponds to the upper quadrants of the typology. The specific scenarios are presented in Fig. 31.

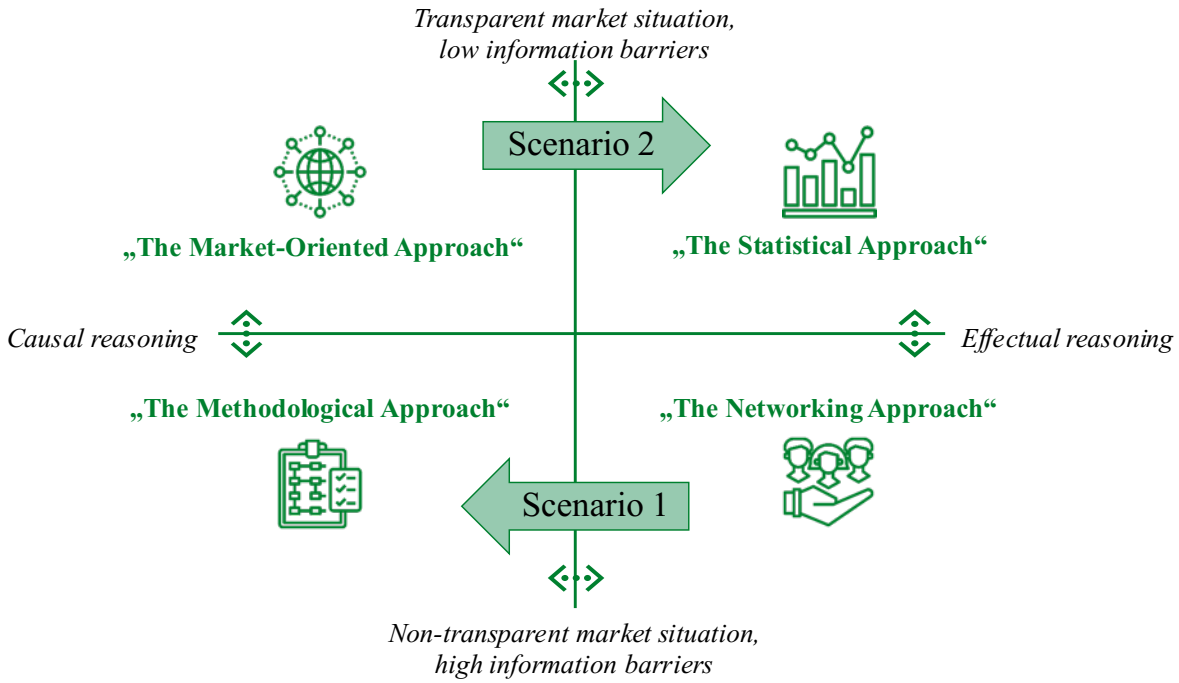


Fig. 30: Scenarios of switching between types of heuristics

In the previous chapters of this thesis, horizontal and vertical switches between heuristics were investigated. It was found that vertically switching between types of heuristics is often the effect of long-term projects, of re-organization processes, top-management involvement, or the development of entirely new information sources for the company. Therefore, these switches are not an intrinsic ability of pricing managers but are rather interdisciplinary and organizational projects. Therefore, the present research project focuses on the switching of pricing managers along the horizontal dimension.

Right after each scenario presentation participants were asked to which degree they identified with the respective price-setting scenario. The follow-up questions asked the respondents how likely it was that they would accept the proposal and switch to an additional heuristic or whether they would be content with the information at hand. Since the questions refer to a specific price-setting process within the manager's company, they also refer to the efforts and costs they estimate for attaining this information. Afterwards, the respondents were presented with the same set of potential challenges in both scenarios and were asked which challenges were relevant in their decision. The

twelve challenges presented in the survey are based on pricing skills (Liozu & Hinterhuber, 2013b), the Price Relevance Model (chap. 6) and pricing culture (Lancioni, 2005; Lancioni et al., 2005). The sequence in which these influences were presented to participants was randomized.

The questionnaire and its scenarios were pretested with fellow students in order to ensure readability, understandability, and appropriate length. All constructs were tested for internal consistency with Cronbach's alpha, which resulted in acceptable values (>0.75) for further analyses.

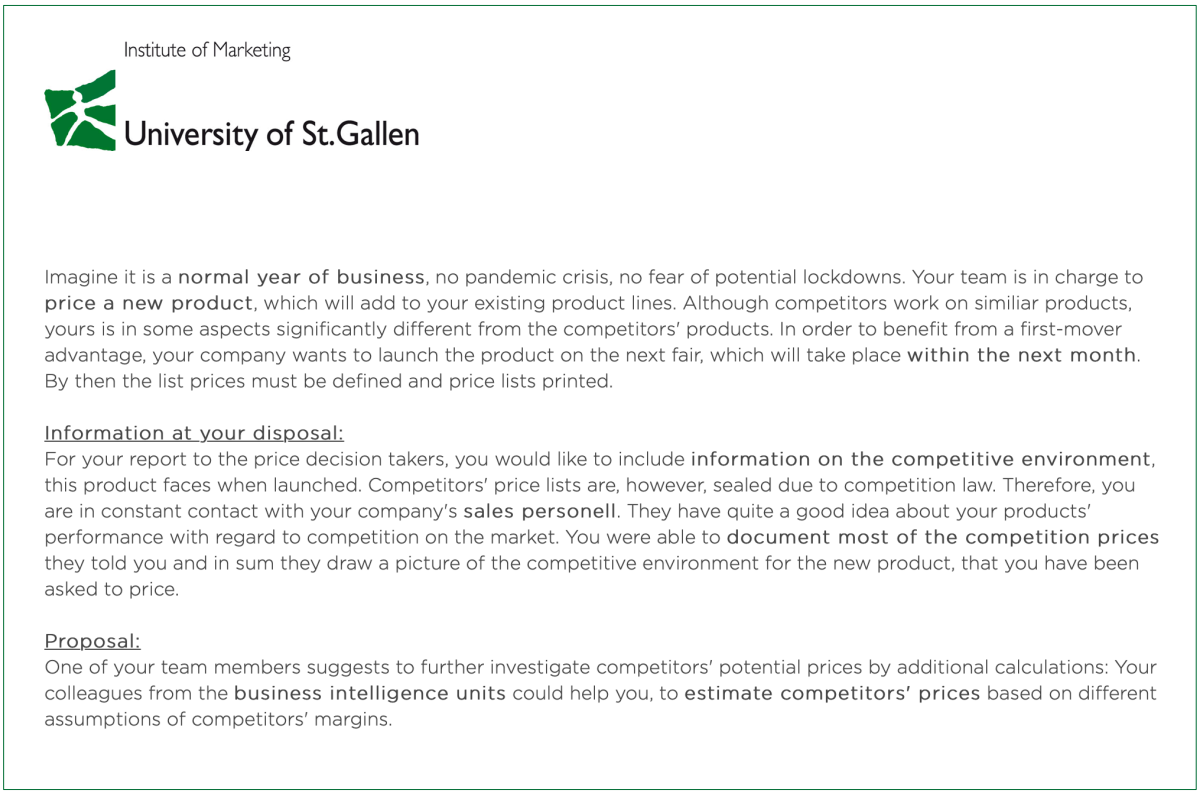


Fig. 31: Two specific price-setting scenarios presented to participants

9.3. Methodology

Logistic regression models identify the effects predictor variables have on the odds of a specific outcome. In this case, the specific outcome is the decision to switch between heuristics, and the predictors are the challenges pricing managers face during decision

making. Therefore, the logistic regression models identify to what degree certain challenges influence the probability of pricing managers switching between heuristics.

The general formula uses the odds ratio of a specific outcome as the dependent variable. The odds ratio indicates the likelihood that an outcome (e.g., switching) occurs, given a specific predictor (e.g., the challenge of having no time to experiment). In a logistic regression function this is represented as follows:

$$\frac{p}{(1-p)} = \exp\left(\beta_0 + \beta_1 x_1\right)$$

Equation 7: Logistic regression function (odds ratio)

Since in regression analyses the effects of linear combinations of predictors are estimated, the regression models transform the general function and use the log odds for the outcome:

$$log\left[\frac{p}{(1-p)}\right] = \beta_0 + \beta_1 x_1$$

Equation 8: Logistic regression function (log odds)

Hereafter, the log odds will be referred to when the coefficients of the regression models are reported, i.e. the directionality of predictors' effects on managers' decisions is analyzed. The effect of predictors on the odds of pricing managers' decisions will be indicated by the odds ratio.

In accordance with the research question that asks for the challenges that hinder pricing managers in their attempts to switch, the outcome variable in this chapter is defined as

1 = pricing managers decide to switch (values of 6–7) and

0 = pricing managers, who are not determined to switch (values of 1–5)

From a configurational perspective the group of pricing managers that are not strongly in favor of switching (1-5) is a superset of the pricing managers that confidently decide not to switch (1-2). The superset includes all pricing managers that clearly decided not to switch and, in addition, all the ones that were undecided. The group of pricing managers that decided to switch had to indicate a decided "yes", hence a value of 6 or 7 on the scale. Since this research project investigated supra-pricer behavior, it is of interest what separates the "switchers" from all the others in this sample. This is the reason for the codes indicated above.

All analyses and modelling in this study were conducted using the software R.

9.4. Descriptive Statistics of the Sample

In the process of data cleaning, the answers of participants with no direct or indirect relationship to the pricing function in their companies were excluded from the analysis. The following subchapter presents the characteristics of the remaining 257 participants and their companies as well as summary statistics of the surveyed constructs. As in the previous study (chap. 8), participants were asked to answer every question in reference to a specific and if possible current setting of their pricing function.

The majority of respondents is involved in developing their companies' pricing strategies (85%), price analysis is conducted by 65% of participants, the price decision is facilitated by 78%, and the smallest proportion of managers in this sample engages in price controlling (Fig. 32). Interestingly, more than a third (38%) indicate that they are involved in all four steps of the price-setting process. This indicates that the pricing role often involves managing more than one stage of the pricing process and supports the argument that pricing is not only an operative task but is considered a strategic capability in pricing practice.

This argument is also reflected in the management levels present in this sample, which show different foci during price setting: Top managers mostly engage in pricing strategy and price decisions. Middle management is somewhere in between, with a slight tendency towards strategic tasks. First-line management is mostly involved in the price decision, which is not surprising since they would be the first negotiation partners for customers. Nor is it surprising that the employees' focus is on operational price analysis. This distribution is evidence that the pricing function within companies is usually spread across roles and hierarchy levels (cf. chap. 1), which was found to be beneficial to a firm's profitability by Homburg, Jensen, et al. (2012) but at the same time requires intense information and coordination management (Totzek & Alavi, 2010b). B2B settings in particular can benefit (and lose) with their organization of the pricing authority (Homburg, Jensen, et al., 2012).

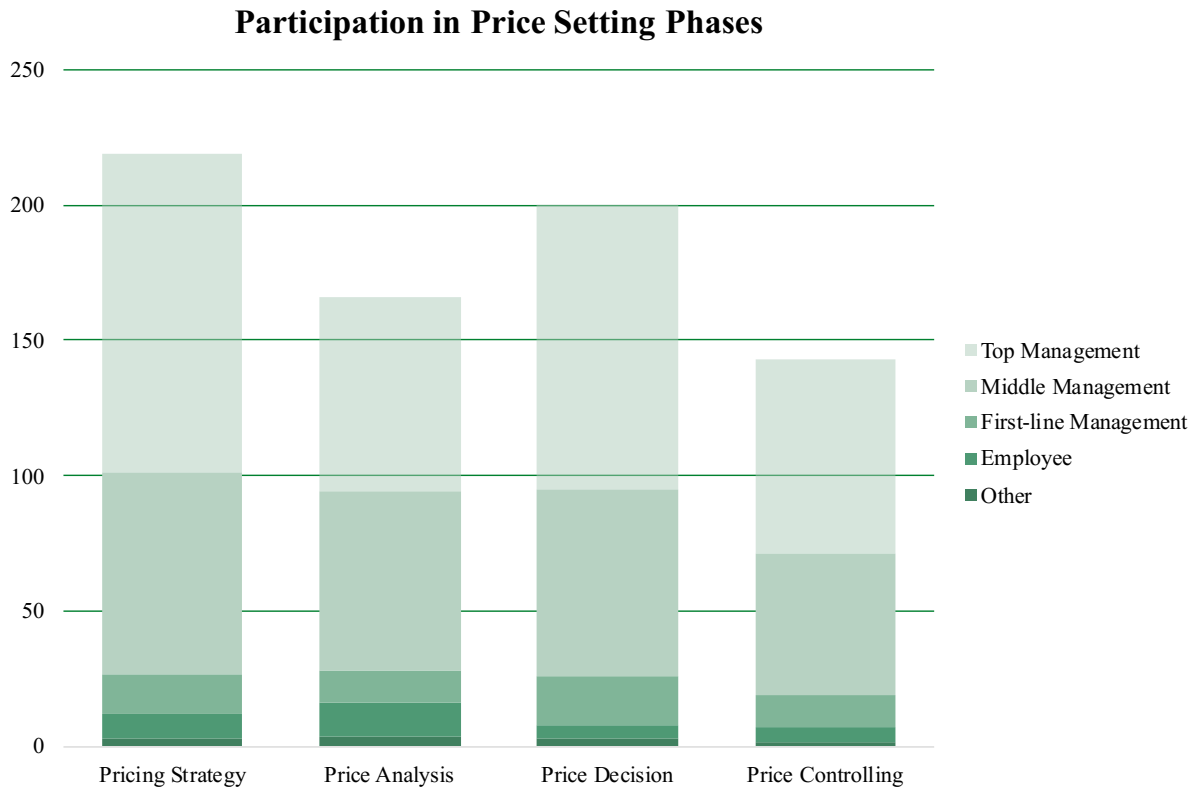


Fig. 32: Distribution of participants' involvement in the price-setting process

Fig. 33 gives an overview on the characteristics of participants' companies, which are crucial variables when observing the conditions under which pricing managers operate. These descriptive statistics show that managers in the sample are predominantly involved in price setting in B2B relationships, and mostly in large companies within the DACH region. In the majority of cases, participants referred to the pricing situation of a physical product when answering this survey.

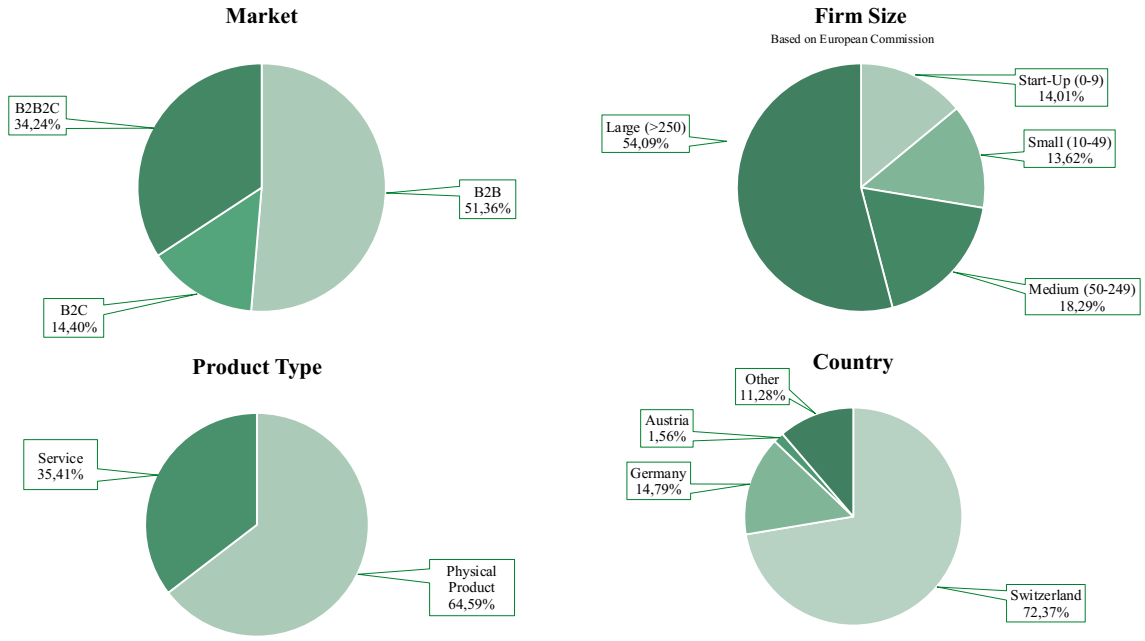


Fig. 33: Characteristics of participants' corporate environment

In addition to these descriptive statistics, Table 11 gives summary statistics of the constructs that were part of the survey. The seven constructs all show acceptable values of Cronbach's Alpha (>0.75), which suggests their internal consistency even when adapted to the realm of pricing. Therefore, these constructs may be used for further analyses with their original numbers of items.

The summary statistics suggests that pricing processes in this sample are rather formalized and centralized. This indicates an important role of hierarchy in pricing and relatively little autonomy of pricing managers. This could be due to the general importance of price decisions, which leverage firm profits. In fact, pricing managers in the sample reported top-management involvement to be significantly above the theoretical average. From the previous qualitative analyses, it can be derived that many companies have divided the decision-making power according to their hierarchical level and the importance of a price decision. This could be a further explanation for pricing managers' perception of highly controlled and formal pricing processes.

At the same time it is remarkable that pricing managers report low levels of specialization in their pricing units. This can mean one of two things: First, pricing managers may often be not just in charge of pricing but have other functions across business units, engage in various topics, with blurry task descriptions. Second, these low values could indicate that pricing managers feel unprepared for the pricing tasks at hand and should be trained and/ or supervised more intensely.

In order to gain in-depth insights into the dynamics of price setting heuristics and the influence of said circumstances, the analysis was conducted in three major steps: First, the two scenarios and their results will be demonstrated and discussed (subchapter 9.5). Second, the challenges which influence the decision to switch between causation- and effectuation-based heuristics will be examined (subchapter 9.6). And third, the outcome of applying only one type of heuristic is investigated (subchapter 9.8). In summary, the results will be used to derive conclusions for pricing theory and recommendations for the practical professionalization of price setting.

Variable Name	n	Type	No. of items	Med.	Mean	Min.	Max.	St. Dev.	Cronbach's Alpha
Competitive Intensity	251	Items ordinal, construct interval scale (7-point Likert scale)	6	3.17	3.21	1	5	0.72	0.77
Formalization	257		5	5	4.97	1	7	1.05	0.76
Centralization	257		4	5	4.8	1	7	1.13	0.78
Specialization	257		3	3.67	3.65	1	7	1.45	0.79
Top-Management Involvement	257		3	5.33	5.23	1	7	1.05	0.78
Pricing Process Adaptability	257		3	4.33	4.17	1	7	1.34	0.87
Importance of Innovativeness	257		3	5.33	5.3	1	7	1.25	0.88

Table 11: Summary statistics of constructs

9.5. Analyses of Pricing Managers' Decision Making

In this subchapter the decision making of participants in the two presented scenarios is analyzed. For this purpose, it is crucial to know how well they were able to identify with the presented scenarios. Even if the scenarios were empirically deduced from the

previous qualitative studies, pricing managers can have different levels of identification with the two pricing situations. As this study aims for results that are close to pricing realities, only pricing managers who strongly identified with the scenarios (≥5) were included in further analyses.

Since scenario 1 is a typical situation described in many expert interviews with B2B pricing managers, it comes as no surprise that B2B pricing managers in this sample identified best with this scenario. It was frequently mentioned in the qualitative studies and refers to a situation of high barriers to information and low market transparency – i.e., an archetypical B2B pricing situation. Unsurprisingly, in the second scenario, where market transparency is higher and information barriers are lower, identification of B2B pricing managers dropped by approximately eight percentage points. However, B2C pricing managers showed higher identification levels in scenario 2, which is also in line with B2C markets' tendency towards more price-relevant transparency.

In sum, the scenario on competition prices and the skepticism with regard to information coming from sales personnel were also more frequent in the qualitative B2B-focused studies than the estimation of WTP. This is mirrored in pricing managers' identification quotas as reported in Table 12.

	B2B	**B2B2C**	**B2C**
Scenario 1			
High identification	34.01%	27.03%	29.55%
Low identification	9.10%	8.11%	6.82%
Scenario 2			
High identification	25.40%	45.45%	33.33%
Low identification	26.98%	13.64%	11.91%

Table 12: Identification of participants with the presented scenarios

The distribution of decisions according to the identification with both scenarios supports the decision to exclude cases with low identification (<3) (Fig. 34). In scenario 1 the pricing managers with low identification are indifferent, with the same number of persons switching and deciding against a switch. In scenario 2, pricing managers with low identification would rather not switch, whereas pricing managers familiar with such situations usually switch between heuristics. Pricing managers with low identification can be expected to decide according to their (theoretical) view of the optimal pricing process. Since this thesis focuses on the price-setting realities of managers, only the pricing

managers with high identification were included; even though their decisions may be "less perfect", they are closer to real price-setting practices.

The distribution of decisions to switch found in this analysis supports two major previous findings of this thesis: firstly, it supports the finding from chap. 8 which divided pricing managers into the ones able to apply a variety of heuristics and the ones with rather mediocre levels of pricing professionalization (cf. chap. 8). Secondly, it was found that companies confronted with high competitive intensity are well advised to develop so-called supra-pricers. In fact, in both scenarios approx. 50% of pricing managers clearly decided to switch between heuristics, while pricing managers operating in highly competitive markets showed even higher switching rates in this survey (87% in scenario 1 and 80% in scenario 2).

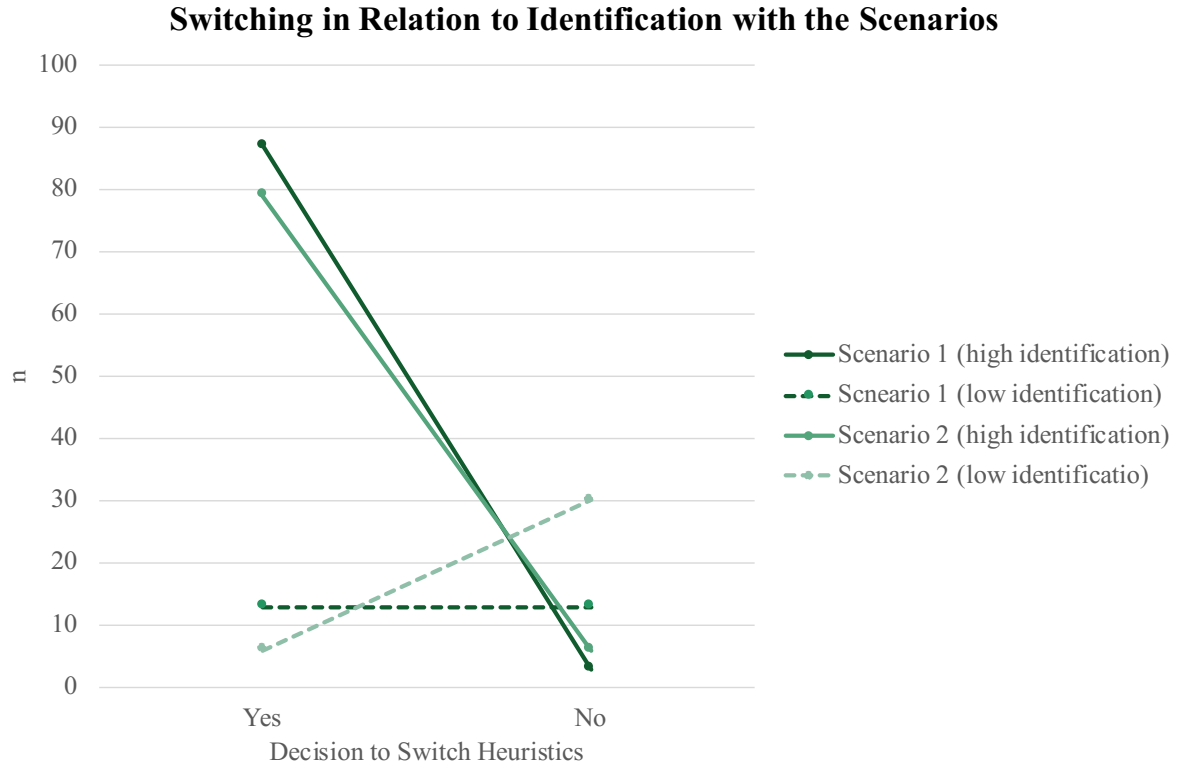


Fig. 34: Decision in scenarios 1 & 2 according to level of identification

Table 13 documents the specific scenario decisions of pricing managers with high degrees of identification. About half of them would decide to switch the heuristic if they were confronted in their company with the given scenarios (values from 6 to 7). The pricing managers who would not switch in such situations account for less than 10%. The remaining 40% are undecided (values from 3 to 5). This result is in line with the ongoing professionalization of pricing processes reported over the last years, which

shows how well companies are equipped to face challenges in price setting (Simon-Kucher & Partners, 2019). It is also in line with the proposition that balancing causal and effectual approaches in price setting is learnable (Read & Sarasvathy, 2005).

Table 13 gives an overview on pricing managers' decision making and summarizes the proportions of the decision to switch. Interestingly, there is only a very small difference between the number of pricing managers with a clear "yes" to switching and the number of those who did not commit to a switch ("uncertain" and "no switch"). From a configurational perspective, a further important fact is the set coincidence between the decisions in both scenarios: not even 20% of pricing managers who identified with the respective scenario decided in both situations to switch. One crucial difference between the two scenarios is the PRID they address, another is the direction of switching. This result is in line with the expectation that pricing managers apply causal heuristics before applying effectual heuristics. In this context it makes sense that pricing managers who already applied an effectual heuristic are well able to add the causal heuristic (scenario 1). Yet a switch towards effectuation is more challenging and usually requires experience (cf. Read & Sarasvathy, 2005) or situations of severe pressure (cf. chap. 8).

Which obstacles and challenges were influential in the two scenarios will be analyzed in the next subchapter. This will help to identify measures with which companies can support pricing managers in becoming more effective in price setting. For the purpose of understanding switching behavior, another interesting group are the managers who would clearly not switch (1–2). The challenges and obstacles they face will be separately analyzed in subchapter 9.8.

No.	Scenario 1	Scenario 2	Set coincidence of decision (same decision in both scenarios)
Certainly Switch / "yes" (6-7)	87 (49%)	79 (50%)	36 (17%)
Uncertain (3-5)	87 (49%)	72 (46%)	32 (15%)
No switch (1-2)	3 (2%)	6 (4%)	0 (0%)

Table 13: Overview on pricing managers' decisions

9.6. Challenges Relevant for Switching Between Heuristics

This subchapter addresses research question RQ10: *What are the barriers that pricing managers face when switching between heuristics?* For answers, the challenges in the two price-setting scenarios are analyzed in the following.

When the pricing managers in this sample were asked which factors were most influential in their decision to switch between price-setting heuristics along the causation/effectuation dimension, most of them named one major challenge for both scenarios (Fig. 35): changing the price-setting process is a strategic decision, not an operative one. This implies that pricing managers do not only need the skills to apply a variety of heuristics (so-called "supra-pricers"), but also the authority to do so. Pricing managers who have this authority with regard to strategic pricing decisions are empowered to vary between heuristics and introduce additional steps in the pricing process. Hence, these managers can autonomously and quickly implement resource-oriented techniques in their price-setting processes, i.e. effectuation-based heuristics.

The second most frequently named challenge in both scenarios was the lack of proper tools for pricing. Proper tools are a prerequisite for being able to cope with many other challenges in price setting. For example, the comparison with competitors is much less of a challenge if proper tools are provided: Only in one single case was the comparison with competitors a severe challenge despite proper tools. The same holds true for the challenge of reacting to market changes: If proper tools were provided, reactions to market changes were only in very few cases (<5) considered a severe challenge for price setting. Therefore, before companies tackle the latter two challenges, they should first consider the introduction of new and the improvement of existing pricing tools. When the tools are in alignment with the team's pricing capabilities this will result in a leverage on several other barriers in price analysis.

A further crucial challenge in the use of price analysis heuristics (rank 6 in scenario 1, rank 5 in scenario 2) is the availability of proper skills – either in the pricing department itself or in the related support functions (e.g., business analytics). This challenge has several origins: either pricing managers and other business units in the company lack the specific skills needed in the pricing process, or pricing managers have no access to other business units, or the business units have no capacity to support ad hoc requests. In fact, when pricing managers have the (ad hoc) support of other business units, providing the proper skills at the right time is usually no challenge in price setting (< 4 cases). Obviously, improving corporate coordination processes and dismantling knowledge silos would help to provide the proper skills in price analysis.

In the present dataset no significant difference was found between the most important challenges in B2B and B2C price setting. However, B2B pricing managers additionally

named the fact that acquiring further information is not valued by decision takers among the most important barriers to switching heuristics. This finding corresponds with the previous results of this thesis, indicating that B2B price-setting processes are diverse, information needs often unclear, and tasks spread across roles. In fact, 20% of B2B pricing managers in this sample indicated that they are not involved in the price decision phase. This again suggests that information needs have to be made transparent and clear throughout the pricing process and pricing analysts who are not involved in decision making need clear-cut instructions on valued information. When they expect decision takers to consider the information base provided by them, pricing managers are more prone to switch between heuristics.

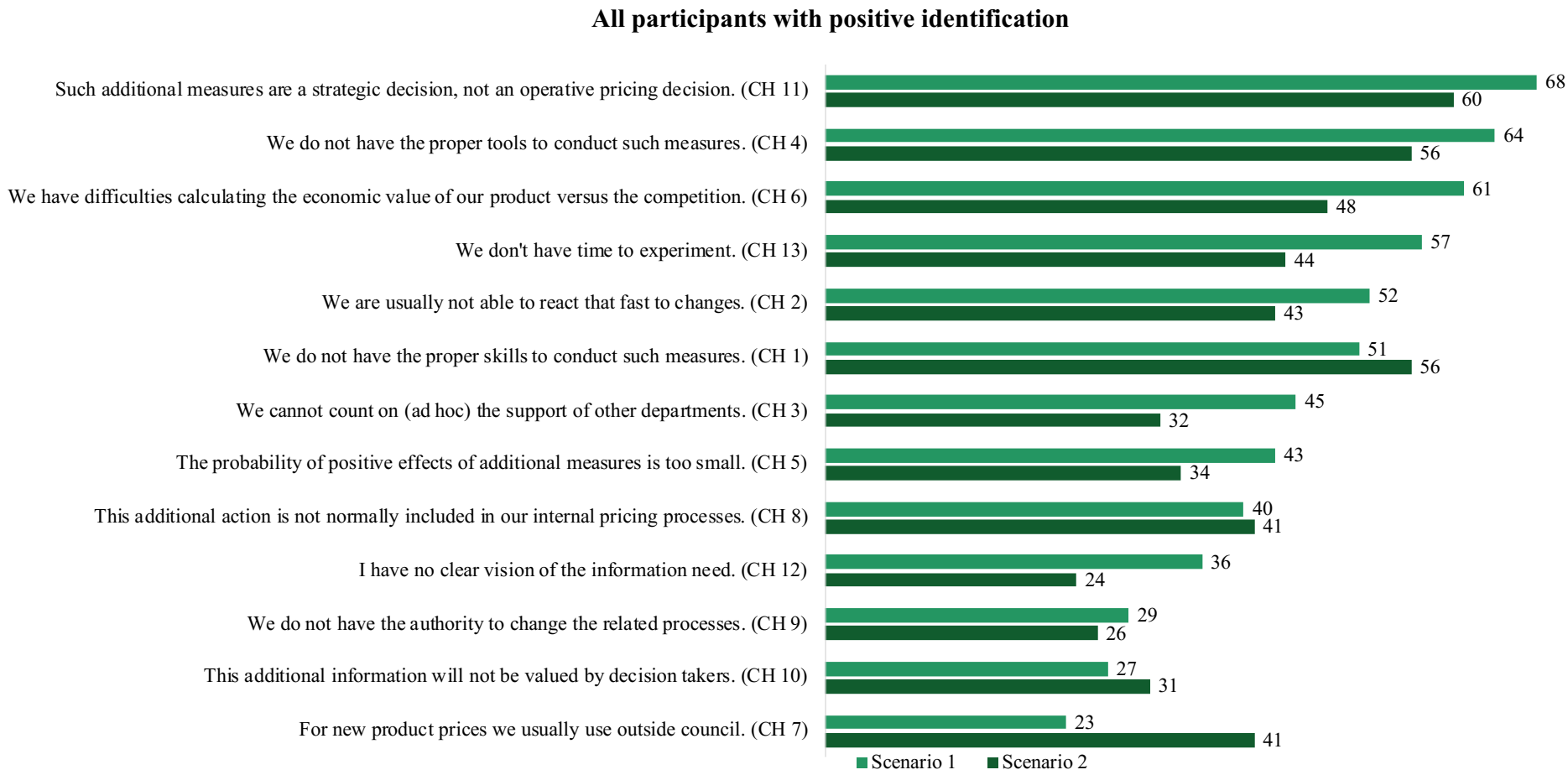


Fig. 35: The most frequent barriers to switching between heuristics (no. of managers indicating values ≥ 5)

The correlation analyses in
Fig. 36 show the bivariate relationships between the various barriers to switching as well as between the barriers and the decision to switch. Only significant correlations at a level of $p < 0.05$ are reported in the figure.

The single challenges are significantly positively correlated since they reinforce each other (light green in
Fig. 36), while they might hinder pricing managers to decide in favor of switching, which shows in a negative correlation (dark green).

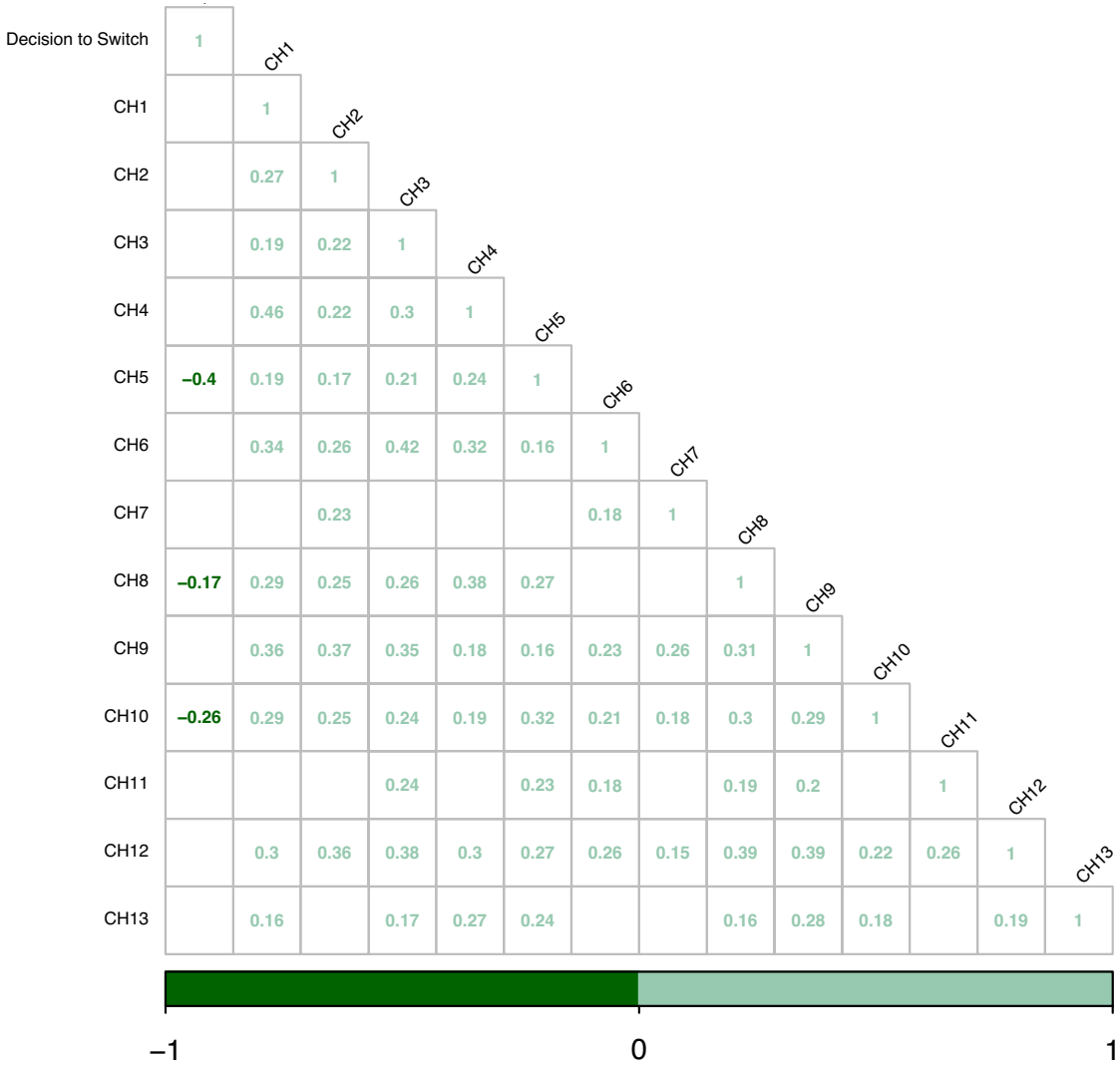
In the two scenarios CH5 and CH10 are negatively correlated with the decision to switch. Both those challenges are directly related to the piece of information attained through additional measures: the first one (CH5) concerns the probability of a positive effect of the additional information, the latter one (CH10) concerns the doubt that decision takers value this additional information. In accordance with the Price Relevance Model (chap. 6), both challenges are reasonable grounds for pricing managers not to take further measures. In other words, these two challenges represent the stopping rules for price analysis defined through the Price Relevance Model. Yet, the two scenarios are designed in such a way that a switch of heuristics would be beneficial for success.

If companies want to convince pricing managers that specific pieces of information are more important than they currently expect them to be, supervisors should clarify, explain and emphasize the value of precise information and the value they put on additional information. Otherwise, pricing managers might not acquire all worthwhile information despite their ability to do so. Such information behavior has a direct impact on the pricing decision and might have negative consequences for firm performance (as discussed in detail in chap. 8).

In the first scenario presented to pricing managers, CH8 (a measure not normally included in the pricing process) is negatively correlated with the switching decision. In the second scenario, CH11 (strategic, not operative decision) is negatively correlated with the switching decision. Both these findings further support the already identified recommendation to give pricing managers a certain degree of strategic power. Without a certain degree of responsibility for strategic pricing, managers might follow a predefined and standardized measures for new product pricing. As demonstrated in this dissertation, such behavior is not effective and actually hinders professionalization in pricing.

Despite the indicated importance, some of the top five challenges show no significant correlation with the managers' decisions (cf.
Fig. 36). This means that pricing managers facing the top five challenges do not generally agree in their decisions. Therefore, the logistic regression models in the next

subchapter will shed light on the conditions under which the challenges actually influence managers' decisions.


Decision to Switch
CH1
CH2
CH3
CH4
CH5
CH6
CH7
CH8
CH9
CH10
CH11
CH12
CH13
1
1
0.27 1
0.19 0.22 1
0.46 0.22 0.3 1
−0.4 0.19 0.17 0.21 0.24 1
0.34 0.26 0.42 0.32 0.16 1
0.23 0.18 1
−0.17 0.29 0.25 0.26 0.38 0.27 1
0.36 0.37 0.35 0.18 0.16 0.23 0.26 0.31 1
−0.26 0.29 0.25 0.24 0.19 0.32 0.21 0.18 0.3 0.29 1
0.24 0.23 0.18 0.19 0.2 1
0.3 0.36 0.38 0.3 0.27 0.26 0.15 0.39 0.39 0.22 0.26 1
0.16 0.17 0.27 0.24 0.16 0.28 0.18 0.19 1
−1
0
1

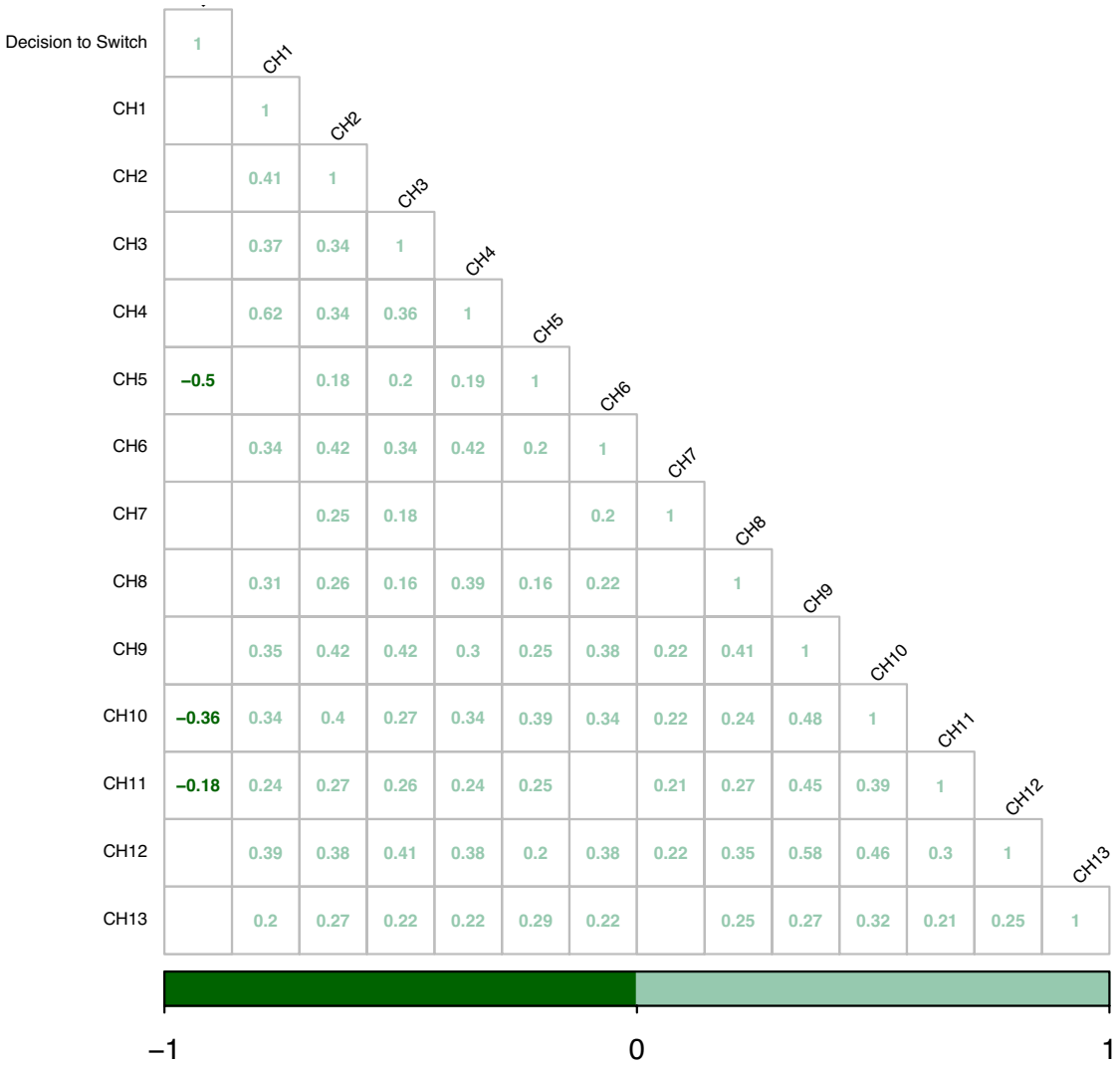


Fig. 36: Correlations between the challenges in scenario 1 and scenario 2 (p-value < 0.05).

9.7. Supra-Pricers' Information Behavior – Logistic Regression Models and the Probability of Switching Between Heuristics

This subchapter further investigates the challenges pricing managers face when applying price-setting heuristics (RQ10 and RQ11). Logistic regression models shed light on the (log) odds of the pricing managers' decisions to switch under given circumstances. The results are used to identify effective levers companies can use to foster supra-pricer behavior in their pricing teams.

Methodological remarks

Control variables and their implementation in regression models have been discussed in detail at several points in this thesis (cf. subchapters 8.6 and 8.7). As before, the following logistic regression models include the control variables company size, product type, and market (B2B, B2B2C, B2C).

In the logistic regression models all constructs measured on 7-point Likert scales are composed of several items in accordance with the published scales (cf. chap. 9). Thus, they can be considered interval-scaled and included in regression models. This is in line with standard practice in regression modelling and frequently used in pricing research (e.g., Ingenbleek et al., 2013; Liozu, 2021; Liozu & Hinterhuber, 2013a, 2013b).

Challenges Directly Influencing the Decision Making of Pricing Managers

The results of the logistic regression models confirm and deepen the findings from correlation analyses. In scenario 1 the probability that pricing managers switch from an effectual to a causal heuristic is negatively affected by the challenges 4, 5, 8, and 10. In other words, the odds of switching heuristics are negatively influenced by:

- the challenge of a lack of proper tools (odds of switching decrease by 21%, log odds of switching decrease by 0.23),
- the challenge of expecting no effects from additional measures (odds decrease by about 43%, log odds decrease by the factor 0.57),
- the challenge that the action deviates from planned pricing processes (odds of switching decrease by about 25%, log odds decrease by –0.29),
- the challenge when pricing managers expect price decision takers not to value the additional information (odds decrease by 28%, log odds decrease by –0.33).

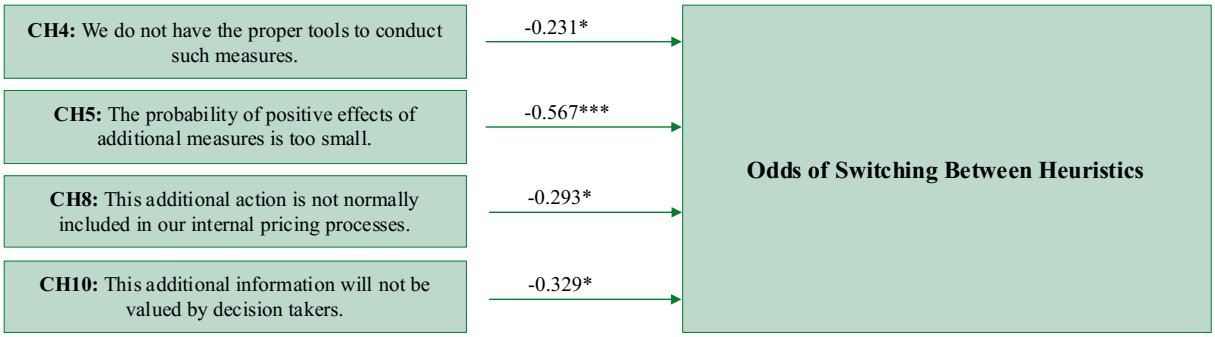


Fig. 37: Direct effects of challenges on the odds of switching between heuristics (logistic regression results of scenario 1)

In addition, pricing managers in B2B companies are less likely to complement an effectual heuristic with a causal heuristic than their colleagues in other markets. In fact, if managers price products in a B2B environment, this decreases their odds of switching by at least 55% (odds × 0.45). This finding is in line with the results of previous studies (see chap. 8): the B2B managers of the Pricing Panel suggested an iterative manner of heuristics application, starting with causal heuristics. Scenario 1 starts with an effectual heuristic, which explains why B2B pricing managers are more reluctant to switch. Therefore, B2B companies should particularly work on the specific challenges to switching if they want their pricing managers to professionalize price analysis.

In scenario 2 the probability that pricing managers switch from a causal heuristic to an effectual heuristic is negatively affected by two challenges (Fig. 38):

- first, by the expected return on the additional information (–0.63 or –46%)
- and second, by their evaluation of decision takers' expectations (–0.44 or –36%).

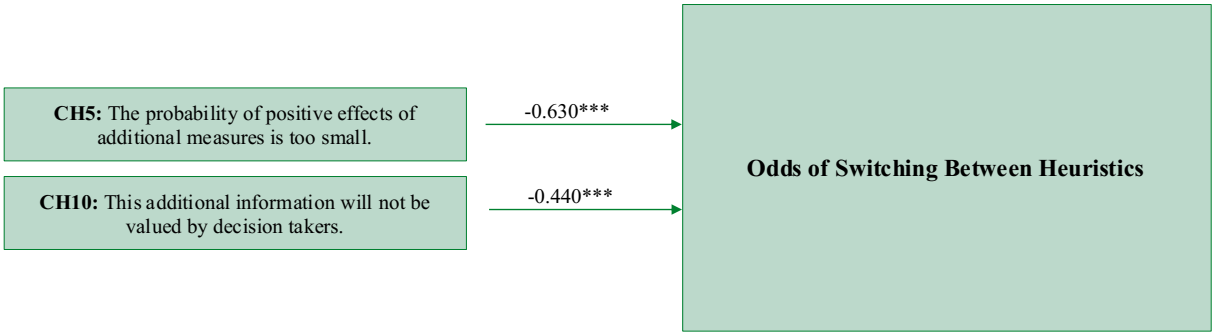


Fig. 38: Direct effects of challenges on the odds of switching between heuristics (logistic regression results of scenario 2)

Therefore, companies who would like their pricing managers to apply several heuristics and exhibit professional price information behavior should leverage these challenges and turn them into strengths. This may be done by simple measures enhancing the exchange among functions and thereby fit the information demand to the information supply, or by including pricing analysts extensively in several steps of the pricing process.

The two challenges, that represent the stopping rules from the Price Relevance Model (CH5 and CH10), are significant in both scenarios (cf. Fig. 37 and Fig. 38). Both scenarios show that the stronger these two challenges, the lower the probability that pricing managers decide to apply additional heuristics. Especially if the two challenges interact, i.e. pricing managers expect information to have no effect on the price decision and they consider adding causal or effectual heuristics a rather strategic decision, the probability that they switch to another heuristic in price setting is decreased. As hypothesized in accordance with the findings from the Price Relevance Model, it is reasonable to stop price analysis when these two challenges, hence stopping rules, are present (H10). Even though the scenarios were specially designed to reveal professional information behavior through switching, the pricing managers still heeded the general rule of information effectiveness in this specific optimization problem. In other words, pricing managers may be inclined to switch to another heuristic in price setting, but a switch becomes less likely if the additional information is expected not to be valued or not to have an impact on price decisions.

However, information search (especially in B2B pricing) often still follows the rule "the more the better" (cf. chap. 6). In fact, the effect sizes of the stopping rules found in this study are significant but lower than expected. Furthermore, in both scenarios around 40% decided that they would switch to another heuristic although they expected decision takers not to value the additional piece of information. This information behavior is at best a misunderstanding and at worst a bias that should be further researched. In any case, it is an information behavior that indicates an information system dysfunction (Rajala, 2019) or a dissonance in the information situation (Berthel, 1975) between price analysis and price decision making. Such a dysfunction creates excess information and might even result in additional information deficits if certain information needs are not met (cf. chap. 4, 6). Furthermore, acquiring information that is possibly not used creates costs and ties up resources. It is in the interests of both price analysts and decision takers to avoid such information behavior.

In summary, it can be said that in this sample the decision to switch between heuristics was mainly influenced by the stopping rules as defined in the Price Relevance Model (CH5, CH10). A switch to causal heuristics was only prevented by missing tools or missing authority with respect to pricing processes. All the other factors considered a challenge in price analysis did not significantly influence the decision to switch between

heuristics in this sample. This is a positive result, indicating that pricing challenges usually do not prevent pricing managers from professional price analysis.

Indirect Effects of Challenges on Pricing Managers' Application of Heuristics

The most frequently indicated challenges (Fig. 35) did not prove to exert individual direct significant influences on pricing managers' decision making in this sample. Yet, this does not mean that the most frequently encountered challenges have no influence on pricing managers' odds to switch between heuristics. Instead, it indicates that these challenges have no general direct effects but may be influential under certain conditions. Therefore, this subchapter explicitly explores the conditions under which these challenges exert their influence on switching behavior. The following results of interaction analyses in the logistic regression models reflect such conditions.

Challenge 4: We do not have the proper tools to conduct such measures.

Despite missing proper pricing tools, pricing managers often try to apply additional heuristics. Yet, this challenge is harder when pricing units are organized in a centralized manner, i.e., crucial decisions in pricing need the approval of superiors (Fig. 39). The introduction of a pricing tool may be considered such a crucial decision as it involves significant amounts of resources and restructuring measures. Therefore, the more centralized pricing units are and the more a lack of proper tools is a perceived challenge in price analysis, the lower pricing managers' odds of adopting further information measures. When pricing units are organized less centralized and introducing proper tools is more straightforward, the odds of managers switching between heuristics are higher. Similar effects were found for the combination of proper tools and the degree of formalization of the pricing process: Formalization in combination with a lack of proper tools renders pricing managers' less likely to decide in favor of a switch. In fact, this combination decreases the odds of switching by about 20%.

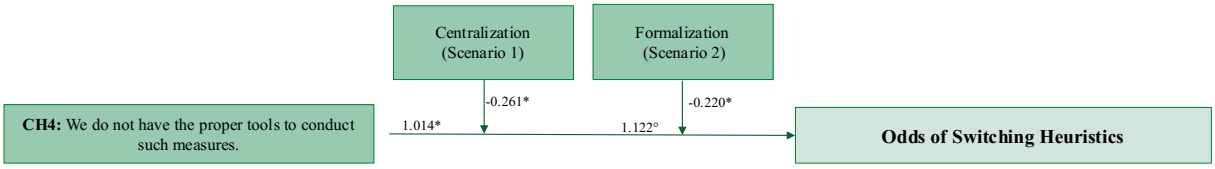


Fig. 39: Interaction effects for challenge 4 (significance codes: '*' < 0.001, '**' < 0.01, '*' < 0.05, 'o' < 0.1)**

Challenge 6: We have difficulties calculating the economic value of our product versus the competition.

As discussed above, experienced managers are capable of applying causation- and effectuation-based pricing heuristics. However, in this scenario they are more likely to refrain from switching between heuristics if their pricing team is unable to differentiate

their product with respect to their competitors. This makes sense since experienced managers understand that precise information on competitors' prices is not helpful when they are not even sure about the economic value of their own product. In this case, pricing managers justifiably are more reluctant to apply further pricing heuristics (Fig. 40).

The combination of formalized pricing procedures and difficulties in calculating the economic value of a product particularly reduces the odds of switching to an effectual heuristic. This indicates that pricing managers' reaction to this PRID (the economic value of a product) depends on the formalization of pricing procedures in their company. As demonstrated previously, effectual heuristics are considered a deviation and are only possible if companies do not insist on pre-defined pricing processes.

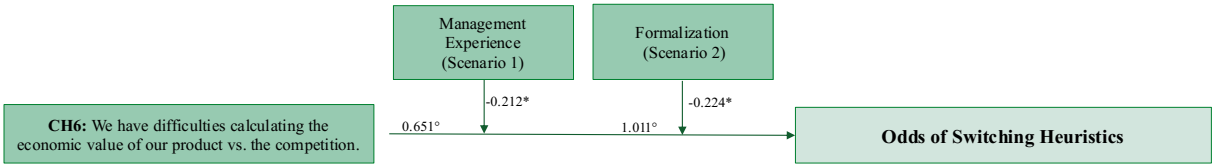


Fig. 40: Interaction effects for challenge 6 (significance codes: '*' < 0.001, '**' < 0.01, '*' < 0.05, 'o' < 0.1)**

Challenge 11: Such additional measures are a strategic decision, not an operative one.

Considering an additional information acquisition measure a strategic decision is not significant in the first scenario and negatively correlated with switching in the second scenario. This indicates that most pricing managers did not consider an additional causal heuristic a strategic decision, whereas turning from causal to effectual heuristics was considered strategic. Since causal heuristics are the traditional management approach and effectual heuristics are considered to disrupt defined pricing processes, this distinction seems reasonable. When challenge CH11 and CH5 interact, i.e. additional measures are strategic decisions and no positive effects are expected, understandably, this significantly reduces pricing managers odds to switch heuristics (Fig. 41).

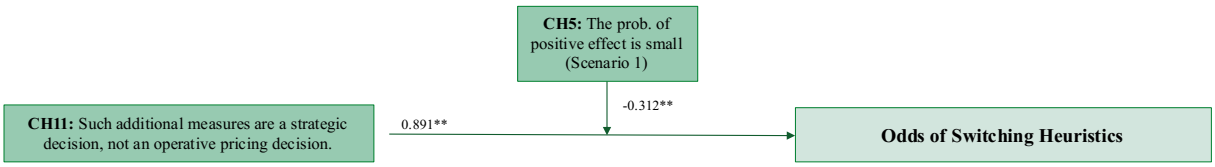


Fig. 41: Interaction effects for challenge 11 (significance codes: '*' < 0.001, '**' < 0.01, '*' < 0.05, 'o' < 0.1)**

Challenge 13: We do not have time to experiment.

If pricing managers consider time for experimentation a challenge to their information behavior, they naturally tend to switch less to a further heuristic. However, this effect is moderated by the business environment, i.e. the regression line for B2C companies is flatter than the one for other companies. This means that if B2C pricing managers have no time to experiment, they are still more inclined to switch heuristics than their B2B colleagues are. Or the other way round, B2B pricing managers are more likely to refrain from switching between heuristics, the more they consider additional measures experiments (Fig. 42).

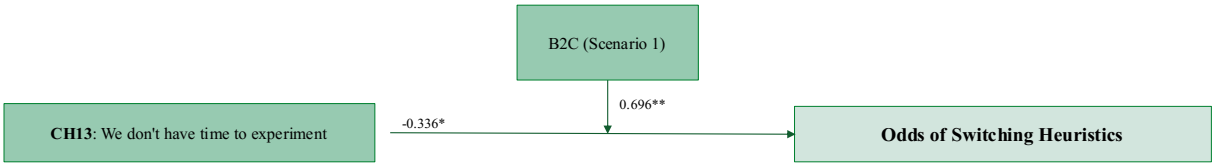


Fig. 42: Interaction effects for challenge 13 (significance codes: '*' < 0.001, '**' < 0.01, '*' < 0.05, 'o' < 0.1)**

The remaining challenges were not found to have a significant impact on the pricing managers' decision making with regard to heuristics. In other words, the degree to which pricing managers consider these challenges present in their pricing situations does not significantly affect their likelihood of applying a variety of heuristics in the presented scenarios.

9.8. Managers' Decision to Apply Only One Heuristic in Pricing – an Analysis of Configurations

In addition to the challenges preventing pricing managers from switching between causal and effectual heuristics, it is worthwhile to investigate the motives of the pricing managers who decided not to switch. All the pricing managers who indicated a value equal to or below 3 in the survey actively shifted away from the indifferent middle (4) towards a smaller number. Therefore, they all belong to the set of pricing managers who tend towards not switching between heuristics. This specific set of pricing managers contains exactly 12 cases in the first scenario and 18 cases in the second scenario. Since these sample sizes are too small for any purely quantitative analysis method (e.g., ANOVA, regression analyses), descriptive statistics will provide a picture of the non-switchers' situation of price analysis. Thus, this subchapter further addresses the second research question of this chapter: RQ11: *Under which conditions do pricing managers decide not to switch?*

According to the findings in chapter 8, scenario 1 presents a situation in which the switching decision should be a straightforward one. Since causal heuristics represent the classical management way to think about pricing, pricing managers should have no difficulties complementing the effectual heuristic with a causal one. In fact, most of the participants decided to do so, only twelve of them did not. Among these twelve there are two cases in which the managers work in markets with low competitive intensity (<3). In line with previous results, in these cases supra-pricing behavior is not necessary and not as useful for successful pricing as it is in highly competitive markets.

In scenario 1 the non-switchers differ from the switchers in several dimensions (Fig. 43). Non-switchers are confronted with situations of notably more formalization and less innovativeness in comparison to switchers. This indicates that the non-switchers in scenario 1 operate under structured and pre-defined processes that are not easily interrupted or changed. Mosrt managers in this non-switcher subset experience strong hierarchies, centralized pricing organization, and formalized processes with high involvement from top management in pricing. This amends the previous findings of this study, confirming that for switching between heuristics strategic pricing power is necessary. Otherwise, pricing managers do not change existing procedures even though additional heuristics would lie within their abilities. Moreover, innovativeness in companies supports effectual heuristics but leads managers to underestimate causal heuristics.

Scenario 2 presents a situation where pricing managers were asked if they would complement a causal with an effectual heuristic. As found in previous studies, this extension is one that needs high pricing capabilities. In comparison to causal heuristics, effectual heuristics tend to disrupt established pricing processes (cf. chapters 6 and 8). In this scenario the set of pricing managers who did not move to effectual heuristics comprises 18 cases. These 18 cases have almost no overlap with the set of scenario 1, meaning that there are almost no pricing managers in this sample that per se decided not to switch. Six of the 18 managers in the set operate under low competitive intensity (<3). Again, these are the companies for which switching heuristics is not as important as for companies in highly competitive markets.

In scenario 2 levels of formalization and centralization are on average slightly lower for non-switchers than they are for switchers. At the same time these non-switchers are confronted with lower innovativeness and process adaptability is even beneath the mathematical average (Fig. 44). These results are further evidence that switching between heuristics is considered a deviation from regular pricing processes – which is in line with findings from earlier studies. If processes in a company are difficult to change, changes in pricing processes are implemented slowly, the implementation has to be approved by superiors although pricing roles are clearly assigned to specific roles, then all of this builds the ground for non-switchers.

In summary, process adaptability and innovativeness are two levers, that can support switching behavior, and should be investigated further. Non-switchers in this sample indicated the same challenges to be crucial in their price analysis as the switchers did. The investigations of this chapter were designed to understand switching behavior and have therefore only little evidence of non-switchers. Further research would be necessary to investigate in depth the information situations of managers that actively decide not to apply more than one heuristic.

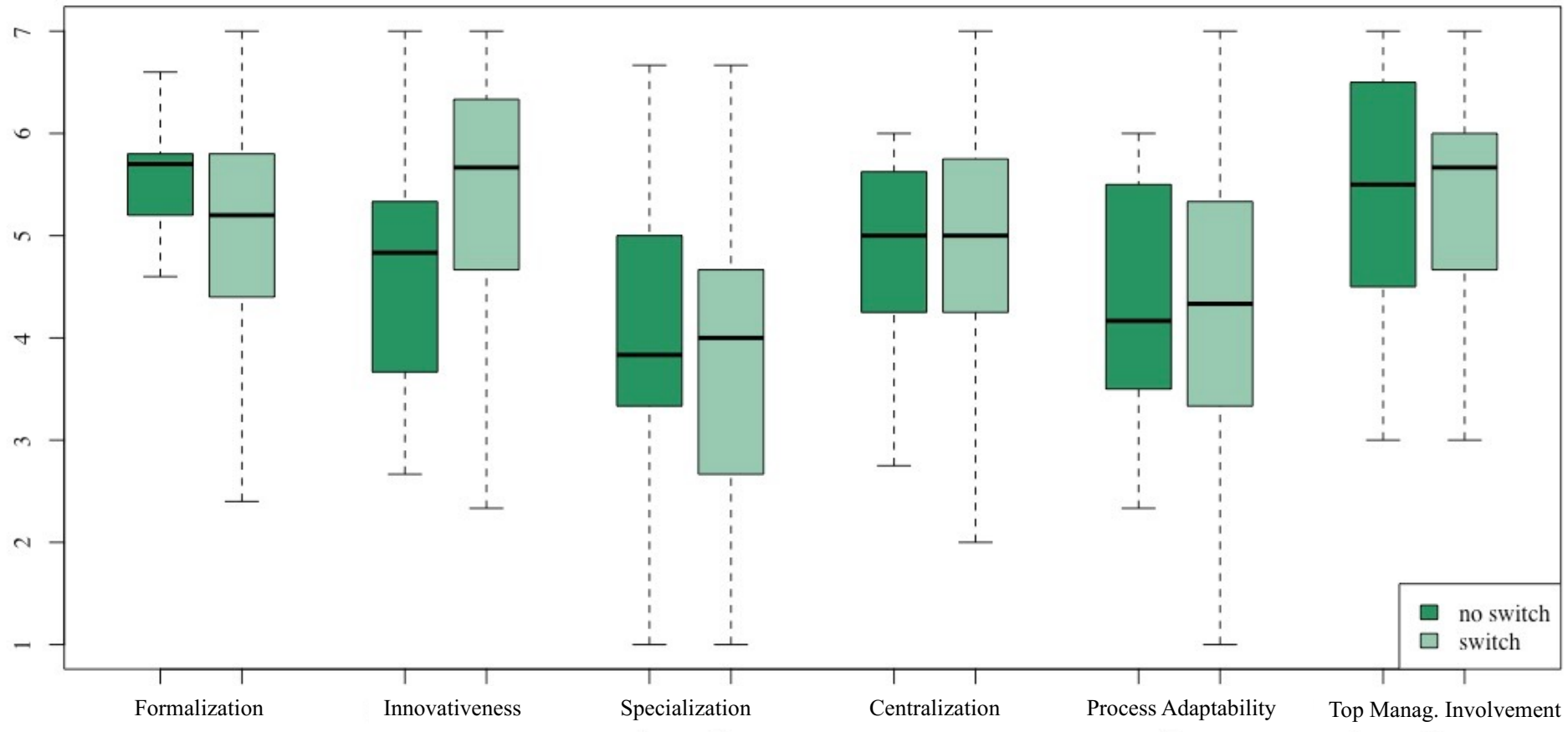


Fig. 43: Comparison of situational conditions in price analysis (scenario 1)

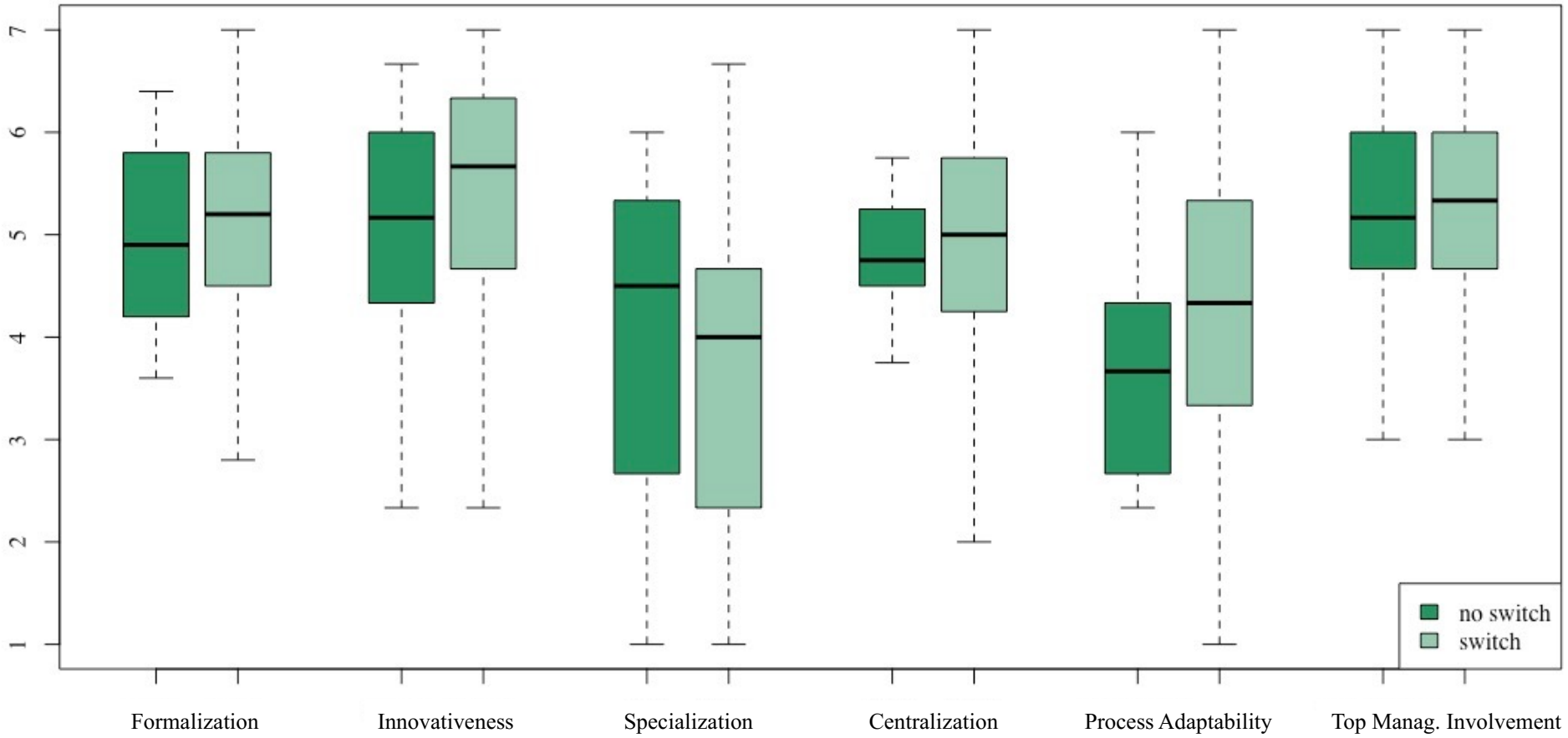


Fig. 44: Comparison of situational conditions in price analysis (scenario 2)

9.9. Summary, Implications, and Avenues of Future Research

Addressing RQ10 and RQ11, this chapter identifies the barriers to switching between types of heuristics and discusses the implications for price analysis.

Summarizing the findings regarding non-switchers and switchers, two major arguments can be made: Firstly, switching heuristics and amplifying price analysis can be useful if measures are conducted to improve information efficiency but not to maximize information, i.e. the stopping rules are respected throughout price analysis. This is in line with the findings from the Price Relevance Model, which gives stopping rules for price analysis (cf. chap. 6). Secondly, if pricing capabilities are considered a challenge to price analysis, it can be useful to expand the capabilities by acquiring more pricing experience in the pricing team. Pricing capabilities are especially important in innovative companies, where competition is intense. In such companies pricing managers tend to use effectual heuristics and underestimate the value of causal heuristics. In contrast, in traditional companies with established products and processes, pricing managers should rather be encouraged to apply effectual heuristics, which often lies "out of the box" for them.

9.10. Main Propositions

- Previous studies showed that switching between heuristics is a skill that can be useful in price analysis and have positive effects on price management. Yet, switching between heuristics is not just beneficial per se. In combination with previous findings, it can be concluded, that pricing managers should have stopping rules that prevent information maximization and act on them during price analysis.
- It is not helpful if pricing managers switch between heuristics to acquire new or additional information if the acquired information is not used by decision makers or does not influence the price decision.
- If not switching between heuristics is a result of missing skills, tools, or authority, this can lead to unfavorable information behavior and diminish the pricing success of companies.
- In such situations companies should evaluate how they can develop the necessary skills, introduce proper tools and distribute the authority in pricing processes. All three measures should focus on pricing units becoming an important, valuable, and valued entity of product development.

In conclusion, the hypotheses proposed at the beginning of this chapter have mostly returned with no clear support but rather conditional answers (cf. Table 14). In order to understand the switching behavior in pricing practice, it would be necessary to conduct further studies: For example, a within-subject experimental setting of real pricing simulations could shed light on pricing behavior. In the survey design of this chapter

participants indicated their intention to switch which not necessarily corresponds with actual behavior. Furthermore, this chapter's research findings could be refined by qualitatively researching the challenges and especially the barriers to switching between heuristics. Apart from the theoretically deduced challenges of this research project a further qualitative research design could shed light on challenges that have not (yet) been taken into account in the pricing literature.

No.	Hypothesis	Hypothesis supported
H8	*Pricing managers are inclined to apply more than one type of heuristic, hence, switch to another heuristic after the first one, to address the present PRID.*	**yes**
H9	*Challenges that are due to low pricing skills negatively influence the decision to switch.*	**partly**
H10	*The stopping mechanisms found in the Price Relevance Model negatively influence the decision to switch.*	**yes**
H11	*Challenges coming from pricing culture negatively influence the decision to switch.*	**partly**
H12	*The degree of authority in the pricing process influences the switching behavior of pricing managers.*	**partly**

Table 14: Results for hypotheses 8–12.

The present study is limited in its results as it works with a scenario-based research setting. The scenarios were deduced from real-world pricing situations and the identification of managers was controlled for, yet the pricing managers in this sample knew they did not have to go through with their decisions. Furthermore, in these scenarios the pricing managers were not able to confer with colleagues or supervisors to decide on switching between heuristics. Although the scenarios were thoroughly evaluated with respect to pricing managers' identification, an open research design following their specific pricing situations in their companies could help to understand their decisions in their "natural" environment. For example, ethnographic study designs could be a promising next step to further develop this line of research.

The list of challenges included in the survey was deduced from challenges found in literature and previous studies. Therefore, this list might not be complete due to omitted variables that can be found only through expert evaluations of the switching behavior. In further research it could be beneficial to have a longer list with no aggregated general challenges but rather granular barriers to switching. Furthermore, additional mixed

methods approaches could help identify challenges that have not been included in this study.

Some of the effects found in the statistical models of this subchapter are very small and not highly significant (cf. Appendix I). They were cautiously interpreted, but a larger sample would be needed for definitely checking these effects. Therefore, the author would be highly interested in replication studies and the effects of within- and between-subject experimental settings.

9.11. Lessons Learned and Recommendations

- The lack of pricing tools can hinder pricing managers in their attempts to switch heuristics. However, the introduction of new tools should be carefully evaluated since finding the tools that fulfill the specific needs of each company is not a straightforward task.
- If pricing managers expect their efforts to make no difference, they tend to reduce them. This is a crucial and potentially damaging situation which could be avoided by connecting the pricing team with marketers and sales personnel. This would serve two ends: firstly, these colleagues can show pricing managers the impact of their work and together they can optimize information and pricing outputs. Secondly, through advanced coordination processes the colleagues can gain insights regarding the question which information is valuable to pricing managers and what more they could gain from delivering their information.
- Companies should seriously consider giving their pricing managers "time to experiment". Having time to try new measures, think about existing resources in new ways, and discussing data analysis with other analytical business units is crucial for developing the effectual mindset. Possible ways to achieve this could be "effectual cells" or job shadowing.
- Supra-pricers are especially useful for companies in difficult market situations. If a company wants to educate pricers to become supra-pricers, it has to create a favorable environment: (1) Supra-pricers need the power to design and re-design pricing processes, (2) they need to be able to make fast and individual decisions within the pricing process, and (3) they need the freedom to use the innovativeness and experience in their pricing teams.
- This, in turn, suggests that an explicit pricing role in companies can ensure professional price analysis and prevent unfavorable pricing behavior.

10. Mastering the Art and Science of Price Analysis: General Discussion and Conclusions

The studies of this thesis addressed the research gap of pricing managers' information behavior during price analysis. The results demonstrate that normative pricing process models described in the literature reflect real-life pricing behavior to a very limited degree. The reality of pricing managers is far removed from these normative pricing models: pricing processes are usually not linear but iterative. Established models miss to include feedback loops between the single stages and the interdependence of pricing tasks. Moreover, these models operate under the assumption that relevant information is available when needed during the pricing process. Furthermore, pricing models are derived from classical management logics and operate under the assumption of causal management behavior. Yet this thesis shows that pricing managers operate under causal as well as effectual logics, which provides the theoretical and empirical basis for rethinking pricing processes in the light of effectuation theory.

Since pricing managers execute all the tasks of price analysis, hence have significant influence on any price decision taken, it is especially crucial to understand their information management. Therefore, this monograph focuses on the information behavior and applied principles in the price analysis part of price setting. As the results of the presented studies show, missing price-relevant information (here called PRIDs) usually, if not always, interrupts the pricing process. Due to the relevance and importance of the missing information, pricing managers cannot proceed to a price decision without it. Therefore, they aim to overcome these PRIDs during price analysis. This triggers information-seeking processes within the phase of price setting.

Conclusion 1: The price-setting process is usually interrupted by information deficits which are bridged via price-relevant information seeking by pricing managers (chap. 6).

When a PRID occurs, pricing managers aim to fill this information need by attaining alternative or substitutive pieces of information. Corresponding to the three price relevance spheres, these pieces of information differ with regard to their precision and their degree of reliability. The information behavior of pricing managers in reaction to PRIDs is represented in the Price Relevance Model proposed in chapter 6. It depicts the process of information seeking, information validation, and the crucial stopping rules.

Conclusion 2: Pricing managers do not accept information deficits in price analysis but search for alternatives and substitutes to fill the gaps (chap. 6).

The heuristics pricing managers apply to attain alternative and substitutive information are of four central types: a market-oriented approach, a statistical approach, a

methodological approach, and a networking approach. These four types of heuristics were found in real-world pricing practices as responses to PRIDs. They can be differentiated along two dimensions: the degree of market transparency and the approach to the information need (causal or effectual logic). These heuristics define sub-processes pricing managers use to overcome PRIDs and, thus, define information behavior in price analysis.

Conclusion 3: The four types of heuristics in price setting define information behavior in price-relevant information seeking (chap. 7).

In market situations with high information transparency, e.g., most B2C-FMCG-markets, pricing managers apply the market-based and/or the statistical heuristic, making use of the openly available information. In market situations with low market transparency pricing managers are forced to develop internal and relational information sources by applying the methodological and/or the networking heuristic.

Seen from a short-term perspective, the vertical dimension of market transparency is a given one. Yet the studies of this monograph show that pricing managers take actions to influence and change their access to market information or their development of internal sources via longer-term measures. Said measures are time-consuming and resource-intense and often the result of overarching price-related company projects (e.g., with the support of consultancies or central pricing units). Furthermore, legal restrictions usually set limits to the degree of market transparency, especially in B2B environments.

Conclusion 4: The dimension of market transparency and the access to market or internal/ relational information sources may be influenced with time-consuming and resource-intense efforts (chap. 7).

The horizontal dimension of the typology of heuristics represents causal and effectual approaches which relate to the underlying logics in price analysis. Traditional price-setting models include mainly causal principles, yet this monograph demonstrates that pricing managers apply effectual principles as well. Fig. 45 shows the causal and the effectual approaches to price analysis. There is one crucial difference between causation and effectuation logics with respect to information deficits: the causal process defines a PRID as the difference between the relevant information set and the information gathered in price analysis. This means that causal processes are designed to answer information needs defined by price decision takers, while in effectual processes pricing managers are in charge of defining the relevant information set that decision takers receive as their decision basis. In other words, in causal processes managers act on a specifically pre-defined information need, whereas in effectual processes they define which information needs are relevant to address.

Conclusion 5: By including both causal and effectual approaches in price-setting process models, the modalities of price analysis as well as the relationships between resources and information goals of pricing practices are represented (chap. 8).

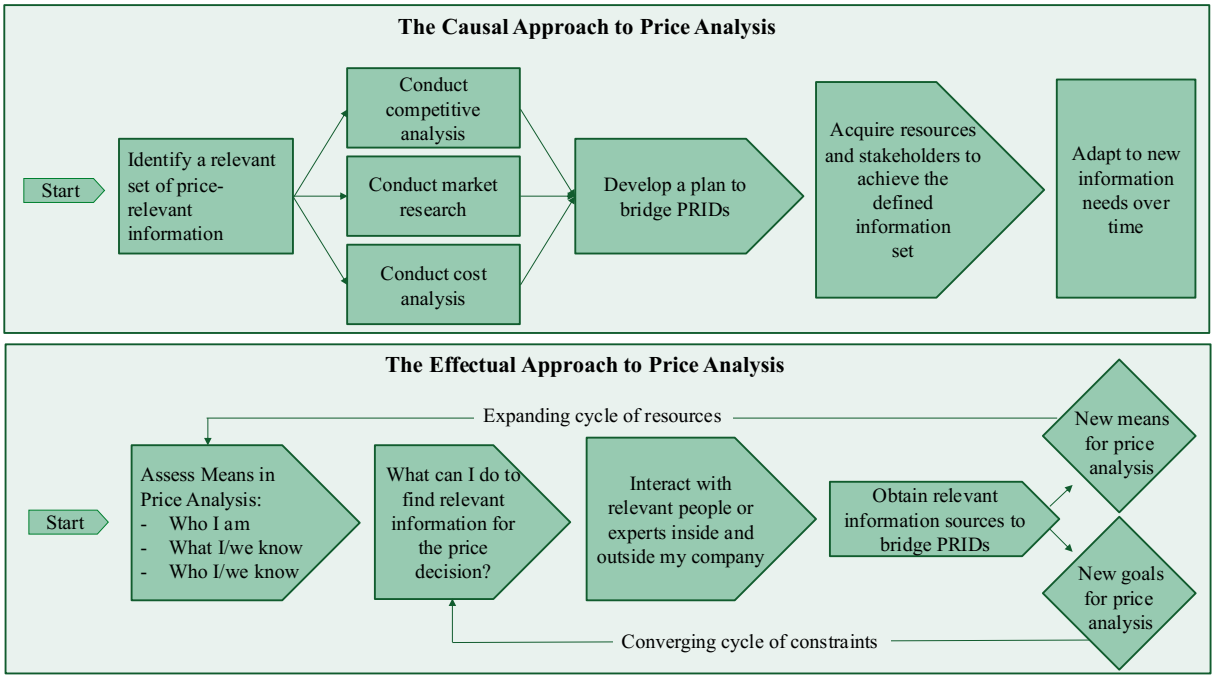


Fig. 45: The causal and the effectual approach to price analysis

The hitherto purely causal price-setting models presume that the process can be conducted in a linear and pre-defined manner. Yet the results of this monograph show that stress, time pressure, pressure to act and external restrictions to price information often prevent causal processes from succeeding. Therefore, pricing managers have been shown to switch between causal and effectual approaches during price analysis. Switching between these two modes of price analysis has been found to positively influence the pricing capabilities of managers and can thus be expected to increase firm performance. Nevertheless, the application of further types of heuristics is subject to the constraints of crucial stopping rules of information efficiency, e.g., the information's contribution to the price decision or the expected change a piece of information provokes in a price decision.

Conclusion 6: Pricing managers who are able to switch between the four types of heuristics in price analysis are more effective in their pricing behavior and contribute to their company's performance (chap. 8).

While the ability to switch between different types of heuristics is always useful for a pricing manager, the actual switch has a situational component. First of all, the stopping rules constitute general constraints to any switch. Hence, when an information is not

expected to have an impact on the price decision and price decision takers are not expected to act on this additional piece of information, the commitment to information efficiency will stop the application of any further heuristics. Yet the less information is available to a company (due to endogenous or exogenous factors), the more heuristics pricing managers have to apply to attain a reliable information basis.

There are two ways of applying additional types of heuristics: by switching along the horizontal axis, i.e. by applying heuristics based on another underlying logic, or by switching along the vertical axis, i.e. by developing new information sources for price analysis. The research of this dissertation suggests that pricing managers often prioritize causal heuristics as these are in line with traditional management practices. Especially B2B companies tend towards the application of causal heuristics. Only in a next step and if pricing managers reach dead ends or are pressured from inside or outside their companies do they apply effectual heuristics as well. The studies of this monograph show that with increasing experience managers learn to apply both logics and balance the measures accordingly. Hence, even under pressure experienced managers switch flexibly between causal and effectual approaches.

However, in their attempt to switch between heuristics pricing managers usually face some crucial hurdles. The most frequent ones are missing tools, missing access to specific skills and meaningful benchmarking with competitors, not having the time and the freedom to experiment with analyses, and the battle over the strategic and operative power of price analysis. Companies are advised to address such hurdles and encourage the removal of said barriers in order to enable their pricing teams to conduct professional price analyses.

Based on the findings of this thesis characteristic situations can be deduced in which specific switches between heuristics are fruitful for professional price analysis. A switch from causal to effectual heuristics is favorable in situations where …

- … pricing managers are not able to bridge a PRID with one type of heuristic.
- … pricing managers need to react ad-hoc to PRIDs.
- … pricing managers have to find short-term and fast solutions to information problems.
- … pricing managers are under pressure from the market as well as from inside the company.
- … pricing managers have to determine the price of innovative products or products of high quality.
- … pricing managers have only few resources or experience a resource-cut.
- … companies operate in innovation-driven, highly competitive or highly technical market environments where the reduction of uncertainty can crucially sustain competitive advantage.

- … the product is new to the company and will be placed in a market the company is not familiar with.

A switch from effectual to causal heuristics is favorable in situations where …

- … pricing managers are experienced.
- … pricing managers mainly rely on their carefully developed information sources.
- … pricing receives more management attention and can gain additional budget for market-oriented or methodological measures.
- … pricing teams are used to operate under pressure.
- … pricing teams consist of many experienced managers.

Moving between a causal and an effectual heuristic can be supported by generally strengthening the respective causal or effectual principles. Furthermore, it was shown that various variables indicating pressure led pricing managers to switch from causal to effectual heuristics. Especially if pricing teams are used to a certain level of pressure, a conscious switch towards effectual heuristics can improve their pricing success. Addressing these obstacles and reducing the barriers for switching heuristics increases the chance of pricing managers making use of the whole range of price analysis heuristics (Fig. 46). Specific management measures that support switches between causal and effectual heuristics can be team compositions with different levels of experience to ensure causal heuristics are not undervalued and effectual heuristics are applied when necessary. Furthermore, “effectual cells” (Wiltbank et al., 2009) and job shadowing projects can support the information behavior of pricing managers.

Conclusion 7: When pricing managers face a PRID that requires an ad hoc solution they should switch between causal and effectual types of heuristics. This switch represents a short-term measure of professionalized price analysis and contributes to price success (chap. 7, 8, 9).

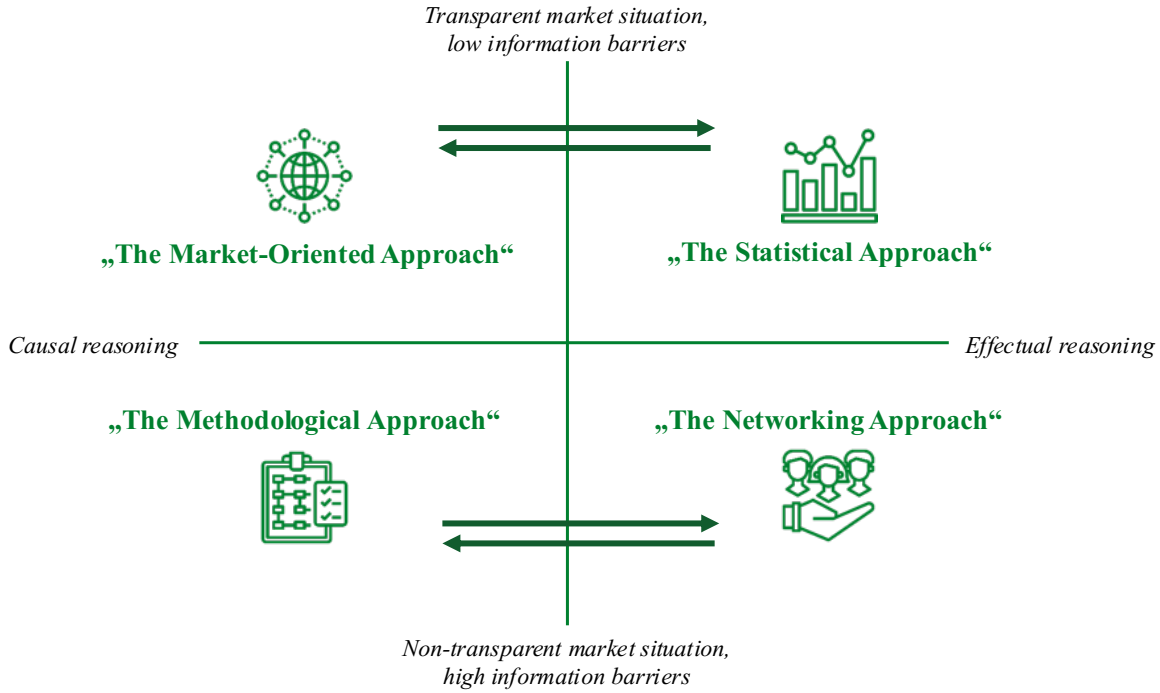


Fig. 46: Switching between causal and effectual heuristics (horizontal axis)

The second possibility for switching between heuristics consists of a move along the vertical axis. Movement along this axis represents a better access either to market information or to internal/relational information. In other words, high market transparency allows for (almost) open access to market information, whereas low market transparency forces pricing managers to develop alternative information sources. In the short term, this dimension is a given parameter for pricing managers. Yet in the long run, pricing managers can impact market transparency. Coming from an non-transparent market situation with high barriers to market information access, pricing managers can invest in acquiring new insights through market information sources or through contextualizing openly available data. Coming from a rather transparent market information situation, further heuristics can be applied if pricing managers develop internal or relational information sources.

Such a vertical switch is fruitful for companies in situations where…

- … the information problem is expected to turn up again in future price analyses.
- … the information deficit is caused by an exogenous factor.
- … pricing managers expect price-decision-relevant information from new information sources.

- … pricing managers expect that the investment in this "pricing infrastructure" will pay off over time.

Vertically switching, i.e. developing alternative information sources, often depends on new ideas, time to access and develop sources, as well as on new techniques in price setting. Therefore, a vertical switch often follows a horizontal switch (Fig. 47). Explicit measures that companies can take to promote switches along the vertical axis can be the following: Encouraging and incentivizing exchange with other functions in the own company and from outside the company, e.g., fair visits, industry conferences, or executive education programs. Furthermore, it can be helpful to consult with other pricing managers from various industries to learn from their practices and brainstorm new approaches.

Conclusion 8: When pricing managers face an exogenous, structural, or repetitive PRID, they should take measures to influence market information transparency and develop alternative information sources (chapters 7, 8, 9).

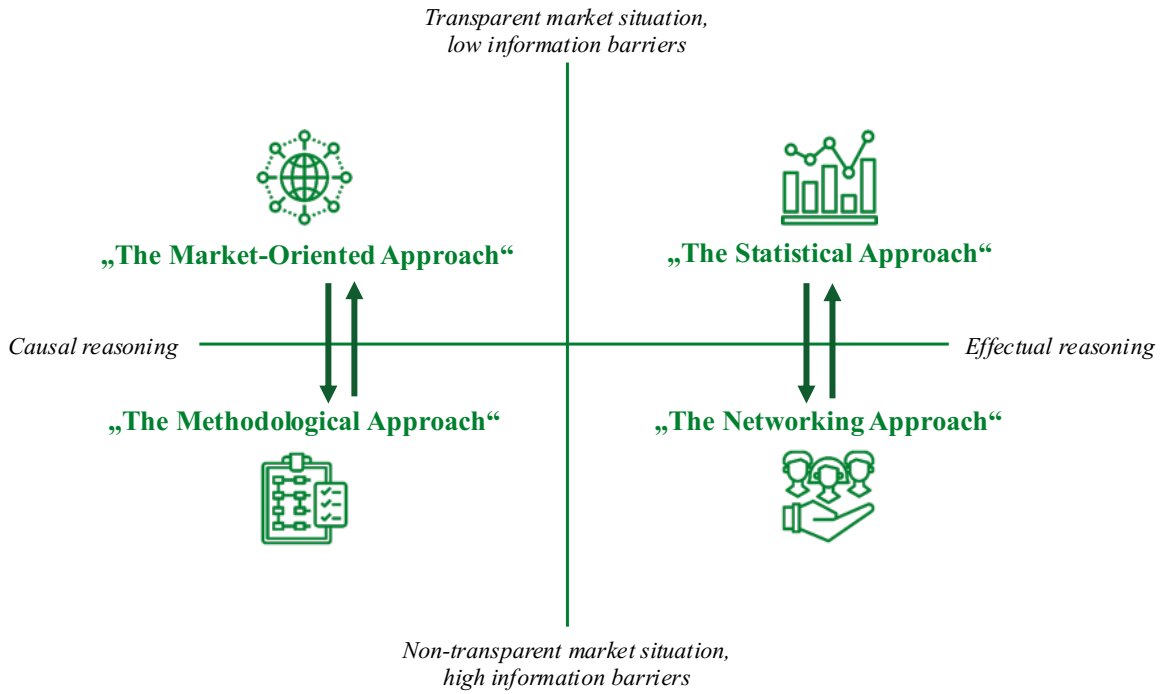


Fig. 47: Switches between market information sources and internal/ relational information sources

In summary, companies are advised to develop their reaction to PRIDs from applying one type of heuristic – their standard heuristic – to switching to further types of heuristics. Thereby they benefit from more reliable and more professional price analysis. The

most efficient management journey through the types of heuristics follows the rules proposed above:

1. effectual heuristics should follow causal heuristics, and
2. vertical switches should follow horizontal switches.

Graphically these sequences result in an hourglass-shaped journey through the types of heuristics in price analysis (Fig. 48). If managers' standard heuristic is an effectual one, they are advised to complement it with a causal heuristic and continue afterwards along the described route.

For the industrial B2B companies this monograph derives implications for, the start of this sequence would be the methodological approach. Adding effectual techniques to their heuristics leads them to apply heuristics of the networking type. If the PRID has still not been bridged successfully, pricing managers should include further market information sources and apply first market-oriented heuristics and lastly statistical approaches.

The newly acquired means and goals derived from effectual processes should build the basis for new pricing processes. At the same time, the results from causal processes should be used to determine the degree of transparency and opportunities to develop further information sources (see Fig. 48).

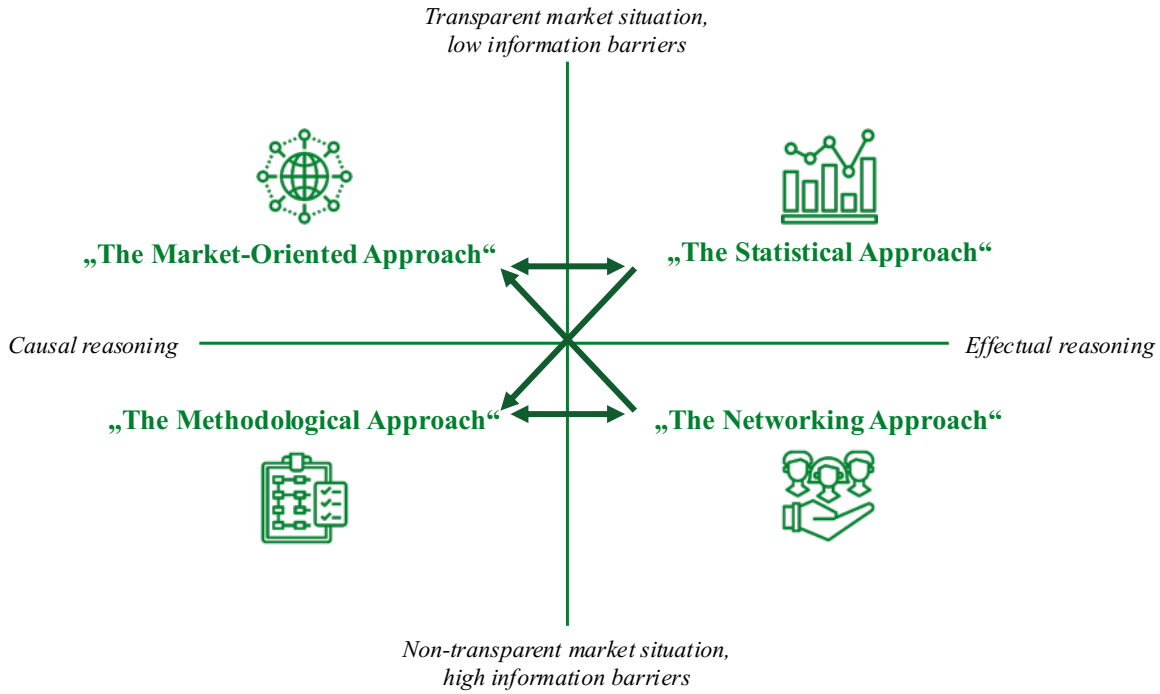


Fig. 48: Recommended routine of switching between heuristics in price analysis

By supporting these switches between heuristics in price analysis, companies can professionalize their pricing. The present research has shown that pricing managers only switch to other heuristics when they are forced to. Yet it was also shown that these switches can significantly influence prices and thereby firm performance. Therefore, companies are advised to use the supporting measures presented in this monograph to enable their pricing teams to include several types of heuristics in their price analysis toolbox.

Final Conclusion: Successful pricing managers have all the heuristics at their disposal and are thus able to switch between heuristics at any time if required in the pricing process.

11. Implications, Limitations, and Avenues of Future Research

So far, the focus of pricing research was mainly on decision making, the degree of rationality, and the related consequences for companies. Yet the information set, which form the basis for any pricing decision have been under-researched (Achterberg et al., 2018). Price-related information deficits impede informed decisions and thus lower the probability of tapping into the full price potential of a product. The studies of this thesis demonstrated that information deficits are crucial challenges for companies and the types of information behaviors in such situations are manifold. By improving the understanding of real-world information behavior in pricing and the heuristics pricing managers use to bridge PRIDs, the results of this thesis allow for the professionalization of price analysis.

Since the problems arising from information deficits are often either ignored in existing pricing literature (see subchap. 4.3) or under-researched (e.g., Achterberg et al., 2018), the related information behavior was chosen as the starting point for this thesis. Consequently, this thesis is dedicated to the understanding and conceptualization of price analysis as the basis for professionalized price decisions, as well as to the managerial knowledge necessary for exploiting the full price potential.

The presented studies contribute to pricing research by answering the following research questions:

RQ1: Which patterns of information behavior disrupt normative pricing models and define price-setting realities?

RQ2: How can patterns of information behavior be used to professionalize price management and thereby positively affect firm performance?

The results presented in this thesis contribute to pricing theory by conceptualizing and assessing price information behavior (subchapter 11.1). Additionally, the findings with regard to pricing practices were used to derive managerial implications for companies and pricing managers struggling with information deficits (subchapter 11.2). The findings of this thesis also open up several new avenues for future research, which will allow researchers to further develop the research stream of information behavior in price setting (subchapter 11.3).

11.1. Theoretical Implications

This thesis contributes to the scientific discourse on pricing by expanding the field's scope through the inclusion of knowledge from information science as well as strategic management to understand, explain, and shape price analysis practices. The research projects of this thesis expand the scientific knowledge on price analysis by conceptualizing and assessing price information behavior.

In addition to the contributions discussed separately in the individual chapters, the contributions of this thesis to pricing theory are sixfold:

1. The Price Relevance Model (chap. 6) deepens the understanding of real-world price-setting processes, examines pricing managers' reactions to price-relevant information deficits, and introduces aspects of information seeking to pricing. Timely and accurate information in price setting (Iyer et al., 2015; Lancioni et al., 2005) directly influences company profits. How pricing managers attain and process information is therefore of major relevance in pricing practice. Consequently, understanding this information behavior should be of utmost importance to pricing research. While established normative pricing models are mainly based on causal principles, the results of this thesis show that effectual principles are just as much part of price analysis. Understanding price analysis as a combination of causal and effectual processes aligns price-setting models with real-world practices and builds scientific knowledge on the micro-foundations in price analysis.
2. By synthesizing concepts of information behavior and strategic management with empirical evidence from B2B pricing, this thesis addresses a highly relevant theory–practice gap: information behavior in price-relevant information analysis. Information seeking, information processing and strategically interpreting acquired information are the major tasks pricing managers perform. Based on the Price Relevance Model and the typology of heuristics in price analysis, researchers can now further develop the understanding of real-world price setting.
3. This thesis is one of the first papers to investigate heuristics in price analysis and their contribution to price setting and corporate performance. The typology of heuristics used in price analysis and the findings on their application (chapters 7, 8, and 9) address an inductively defined problem. Heuristics are an alternative way of describing price-setting processes, which is closer to pricing reality. Although different researchers have indicated the misfit between pricing models and real-world pricing, the problem has not been addressed so far. Therefore, identifying the types of heuristics used by pricing managers was one step in the direction of evaluating these heuristics in comparison to other measures of information processing, such as machine learning or AI-driven price analysis.
4. This thesis draws attention to the importance of price analysis in terms of resources, time, investments, and influence. Price analysis plays a dominant role in pricing practice, yet it has previously been neglected in pricing research. The phase of price analysis has usually been depicted as an operative phase of price setting, in which the availability of information and the relevant analytical skills were assumed to be a given. The explorative studies (chapters 4, 6, and 7) as well as the empirical tests (chapters 8 and 9) showed that these assumptions do not hold true in pricing practice. Yet, reactions to time pressure, competitive pressure, and obstacles in information procurement in price analysis have been addressed only sporadically by traditional pricing models. Though price analysis is crucial for a product's success, the pricing process usually starts quite late in the

product development process leading to increased internal and external pressure for pricing managers. Established pricing models do not account for such types of pressure in price analysis but rather depict an ideal-typical process. Incorporating information behavior and effectuation theory in price setting, this thesis adds to the established models by including situational factors.

5. The results from investigating obstacles in the application of heuristics in pricing (chap. 9) show that pricing managers need strategic power in price analysis to better contribute to the overall firm performance. Therefore, the presented studies also contribute to the identification of relationships between information behavior, tasks in price analysis, pricing capabilities, and the influence on firm performance. The results build the ground for concepts and relationships in price analysis, which further in-depth research endeavors can build on.
6. Lastly, the studies of this thesis showed that information deficits disrupt managerial processes in pricing (chapters 4 and 6). This insight resulted from a change in perspective when researching management processes, namely the management journey approach. Instead of describing ideal-typical process models, the management journey approach takes the perspective of managers and follows their real-life processes, in this case, the pricing process. Using this research method, it becomes possible to identify challenges and disruptions of processes. In the case of this thesis, following the price management journey led to identifying the relevance of information behavior in price analysis, thus revealing a crucial research gap.

In summary, this thesis advances the field of pricing, draws attention to the neglected price-setting phase of price analysis, shows that normative pricing models do not completely capture information behavior in price analysis, and lays the conceptual and empirical grounds for researching information-intense managerial processes in pricing and elsewhere.

11.2. Practical Implications

The following implications aid companies, pricing supervisors, and pricing managers in competitive and innovation-driven markets in realizing the full price potential of their products. Although the results are targeted towards B2B managers, B2C managers can draw helpful advice from this section as well.

Implications and recommendations for companies:

- The first implication – an aspect often discussed in pricing practice – refers to the question which organizational entity pricing should belong to. Pricing theory and the interviewed practitioners agree that pricing is an interdepartmental task (e.g., Iyer et al., 2015; Lancioni et al., 2005). Companies in the Pricing Panel exhibited

different organizational structures, with pricing as part of marketing, controlling, finance, or even an independent function. Companies that see pricing as an interdepartmental task and have implemented structures that reflect this vision represent the most interesting option. In these cases, pricing units report to more than one board member (e.g., Head of Sales and Head of Marketing) or even to a defined committee of decision takers with representatives of all major company functions (Sales, Marketing, R&D, Controlling etc.). Based on the findings of this thesis, companies are advised to locate the pricing function in an interdepartmental position. Especially in B2B contexts, pricing units depend on direct information flows and high-quality relationships to other departments. If companies want pricing managers to develop information sources and apply the full range of heuristics in price analysis (as discussed in chapters 8 and 9), they should ensure their access to resources and interdepartmental exchanges. Hence, pricing should be part of a specific company function (e.g., marketing, controlling), if said function has the best interdepartmental access and relationships. Otherwise, a positioning within more than one company function (e.g., Sales and Marketing) can support information and coordination management. Furthermore, such an organizational structure can support pricing not only in the coordination for their own goals but also in their intermediary role between different functions and interests. Ideally, this interdepartmental role of pricing mangers is also reflected in all company structures, from physical desk arrangement to the inclusion of pricing managers in crucial milestones of product development. Such measures contribute to pricing managers' options and the effectiveness of their information behavior.

- The previous point has shown how pricing power can be distributed among different roles and people in a company. Another crucial organizational question relates to the distribution of power among the price stakeholders. While giving strategic and operative pricing authority to a pricing unit seems straightforward theoretically, pricing authority is often distributed between product management, sales personnel, pricing, and in some cases even marketing or the company board are involved. Hence, pricing managers often lack the strategic power to shape pricing processes, which prevents them from performing their job to the best of their abilities. Companies are advised to involve pricing managers in more stages of the pricing process beyond price analysis. They should be involved in determining the pricing strategy and creating information bases, in consultations on price decisions, and in controlling the price implementation as a success variable of the company's pricing work. Companies are advised to give their pricing units at least the power to define price corridors and exert exclusive control over case-by-case decisions on leaving these corridors. Pricing units lacking such strategic power are prevented from completing a professional price analysis and might refrain from adapting their price analysis to what is needed to reach an informed

price decision. Since price analysis has the potential to crucially influence price decisions, companies should empower their pricing unit within the organization. Pricing managers can only deliver on their potential to implement successful prices and build meaningful bridges between conflicts of objectives when given the proper power to do so.

- The results of this thesis suggest that investing in price analysis positively influences firm performance (chap. 8). Since price decisions have a direct impact on the profitability of companies and price changes exert significant leverage in B2B contexts, price decisions should be taken as deliberately as possible. Price analysis is worth professionalizing to create positive effects on firm performance. Companies are strongly advised to counter the continuing professionalization of buying centers with a professionalization of their pricing centers. The professionalization of pricing centers can be achieved by investing in managers' pricing capabilities, their information behavior, and their application of heuristics. Companies which have already started to invest in and build a pricing function are advised to train their pricing managers in operative and strategic skills. Especially helpful would be training pricing supervisors in emphasizing causal (goal-oriented) as well as effectual (resource-oriented) approaches to price analysis and training pricing managers by strengthening their causal and effectual pricing principles (chapters 8 and 9). This includes specific analytical skills, knowledge about company relationships and conflicting goals, as well as an actionable heuristics toolbox.

Implications and recommendations for pricing supervisors:

- Balancing the underlying logics in price analysis, namely causal and effectual approaches, is improved by management experience. Therefore, setting up experienced pricing team helps to professionalize the price-setting process. Pricing managers with less experience are expected to apply one predominant logic, while more experienced managers are able to apply both causal and effectual approaches in price analysis. Additional experience results in pricing managers balancing both logics. When composing a pricing team, companies are strongly advised to ensure the representation of all logics, which enables pricing teams to jointly apply all four types of heuristics. The best option for any company is to hire pricing managers who are able to apply all four types of heuristics and – even more useful – teach their approaches to younger colleagues. Strengthening all price analysis techniques also has the advantage that crucial mistakes in price setting can be avoided.
- Pricing supervisors in larger companies are strongly advised to organize and encourage structured exchanges between all roles active in the pricing process. As was demonstrated with the Pricing Panel and identified in company cases, such

an exchange among pricing people provides valuable input and a platform for learning and advice. Furthermore the exchange with price decision takers would support the pricing managers' knowledge about individual and objective information needs. Using this knowledge pricing managers can gain a clearer vision of the information situation and adapt the information set for price decisions (cf. Berthel, 1975; Reinecke, 2004).

- Not only is the exchange among pricing people crucial for professionalizing price setting, but the understanding of information sources can support pricing managers' assessment of reliability. Therefore, one proposition coming from focus group discussions are job shadowing projects within different pricing roles as well as with internal information sources, such as Sales.

Implications and recommendations for pricing managers:

- Over the course of this thesis' research projects it was established that pricing managers tend to maximize information in situations of uncertainty. Yet, it was also shown that such information maximization is often useless or even harmful to the price-setting process: pricing managers should only use resources to attain information if the newly acquired information is likely to change the price decision, which means that it is valued and used by decision takers. Pricing managers are advised to attain information in all three price relevance spheres and validate it as thoroughly as possible. It was shown that measures of information maximization, especially in situations under pressure, can lead pricing managers to rely too heavily on unvalidated pieces of information. A frequently described case that illustrates this behavior is represented by pricing managers using pieces of information gained from sales personnel without verifying this information through additional sources. This results in distorted perceptions of competitors' prices and might lead pricing managers to reduce their prices, even though the information came from a negotiating customer. Clear and thorough documentation of all information entering the company and being processed internally can help to avoid such problems. A best-practice case for this validation behavior in accordance with the Price Relevance Model was presented in subchapter 6.5. The same holds true when pricing managers heavily rely on the results gained with one type of heuristics although more additional heuristics could have helped to render the information base more reliable. The results of this thesis help pricing managers benchmark themselves in their professionalization and define their potential as well as precise further milestones in their professionalization process.

Yet, not in every situation it pays off to invest in the professionalization of price analysis. The analysis of pricing managers' information behavior showed (chap. 8) that in situations with low competition, not much differentiation or product advantage, possibly

low innovation levels in markets, and strongly bound customers, investments in strong pricing capabilities could turn out to be unnecessary. The focus on pricing capabilities would take valuable resources from other more important business units if companies concentrate on specific customers, fit their products, and bind their customers via quality or product fit (cf. 2015a, 2015b). In contrast, for a company selling products to a rather anonymous market and facing the previously mentioned levels of uncertainty and pressure, investments in pricing capabilities can increase prices' leverage on profits.

When companies decide to invest in the professionalization of price analysis, they are advised to ensure that the circumstantial factors in their company allow for this professionalization. Otherwise, their investment will not produce the results described in this thesis. For example, companies that commit to pricing professionalization should also commit to providing fitting and useful pricing tools. Moreover, pricing teams often lack the skills to calculate the economic value of their company's products and therefore react slowly to market changes. The results have also shown that pricing processes usually do not leave time for experimenting with information seeking and analysis, which leaves only little room for pricing managers to switch between heuristics. And lastly, pricing managers often do not have the strategic power to implement new process steps or measures in price analysis. Companies should be aware of all these obstacles to the professionalization of price setting when laying the ground for professionalized price analysis.

Ideally, the practical implications of this thesis contribute to pricing practices on three levels:

- Firstly, companies can put their pricing managers in a favorable position – physically and organizationally –, so that they can develop competitive advantage in information and coordination management. Furthermore, companies are given advice on whether, where, and how to invest in their pricing function.
- Secondly, pricing supervisors address the challenges behind the interdepartmental role of pricing and support the pricing unit in overcoming the obstacles.
- And lastly, pricing managers become aware of their own information behavior, avoid information maximization, and develop their practices towards the application of adequate heuristics.

11.3. Limitations and Avenues of Future Research

Apart from the limitations of the single studies in this thesis, this subchapter addresses the limitations and the scope of this thesis as a whole and maps out future research avenues.

Firstly, all the studies of this thesis are evaluated in light of B2B pricing knowledge. This is because B2B pricing was identified as being crucially different from B2C pricing

and therefore worth researching individually (see chap. 4.1). Although these differences are mentioned in most sources, the studies of this thesis found only slight differences in information behavior in price analysis between B2B and B2C managers. It can be expected that B2C price analysis has several individual characteristics that – due to the focus on B2B pricing – have been neglected in this thesis. One indication of such a characteristic may be derived from the explorative interviews with B2B pricing managers who frequently complain about not having as many transactions and related datasets as their colleagues in B2C markets. At the same time, B2B pricing managers often have more expensive and more technical products, which leaves them with less potential to experiment with prices. Therefore, future research projects could follow up on this thesis by researching the individual characteristics of B2C price analysis and the specific information behavior.

A similar argument can be made with regard to the focus on (new) product pricing. Although the follow-up studies of this thesis did not show any significant differences in information behavior between product and service pricing, the models were developed for the realm of product pricing. Therefore, their validity cannot automatically be extended to service pricing. The same holds true for conclusions regarding all business types according to Backhaus' (2015a, 2015b): The models were developed for products and systems sold to an anonymous market and would have to be tested for individual seller–buyer relationships. Therefore, researchers are invited to expand the presented models with specific characteristics of the service business and one-to-one pricing.

Secondly, this thesis explicitly researched information deficits in the price analysis phase of price setting, as it is the one stage that is entirely conducted by pricing managers. Yet, this thesis only scratched the surface of relationships between price analysis and other price-setting stages. Therefore, the author hopes to provide the groundwork for pricing researchers to further investigate how specific information deficits affect price decisions, price decision takers, and/or price implementation. It is expected that variations in the information sets which are provided as a result of price analysis have a measurable influence on price outcomes. Furthermore, the information behavior in price analysis is expected to be adapted to the specific configurations of decision takers and their hierarchy. Corresponding experiments could reveal the nature of these relationships and derive recommendations for strategic information processing in pricing.

Moreover, the studies presented in this thesis lay the ground for researching the specifics of information behavior in price setting. For instance, this thesis investigated information behavior through survey designs under laboratory (hypothetical) conditions. Pricing managers were asked how they perceive various pricing situations and how they would react if confronted with a specific situation. Such research designs can result in social biases, i.e. pricing managers could report what they think would be a favorable or

professional answer to the question (Jäger & Reinecke, 2009). Furthermore, the laboratory setting is a protected space in which pricing managers are not forced to act on their decisions afterwards. Therefore, pricing managers in such laboratory settings might tend to report the ideal reaction to a situation instead of their real-world reaction. Measures were taken to avoid such biases (cf. chapters 8 and 9), yet further experiments and ethnographical studies could shed more light on pricing managers' behavior in actual price analysis situations. Such ethnographical study designs could build on the findings of the presented studies and investigate the exact moments of applying and switching heuristics. Thus, researchers could find more detailed indications on the antecedents, environmental factors, company culture determinants, as well as the market-related and organizational factors that support switching between heuristics in price analysis. In order to realize such a research endeavor, pricing researchers are advised to work closely together with specific companies to gain access and improve the granularity of their findings.

A further limitation of this study relates to the development of causal and effectual heuristics. It was found that managerial experience helps pricing managers learn and eventually balance causal and effectual heuristics in price analysis. Based on this finding, testing different kinds of management trainings and their effects on the use of causal and effectual principles promises to further improve our understanding of these logics. This could help to better understand the role of managerial experience and give indications which specific trainings can support professional price analysis. It would be eminently interesting to investigate the effects of specific management trainings on professionalization in price analysis in comparison to the effects of hands-on practical pricing experience.

This thesis derived several implications for B2B pricing on the organizational level. Yet, the effects of information deficits in pricing on organizational structures in the long run still remain under-researched. Future research could focus on the translation of short-term reactions to PRIDs, which are at the center of research in this thesis, into organizational changes. Are organizations able to learn from previous information processes? And which characteristics help companies to learn quickly from their problems in price analysis? Such a longitudinal study would require research structures that facilitate access to pricing managers. For instance, the Pricing Panel created for the purpose of this thesis could be used to set up a group of committed companies dedicated to investigating organizational learning in pricing.

Lastly, the explorative interviews of this thesis resulted in avenues of future research that are out of the scope of this thesis. One of them stems from the observation that pricing managers have different opinions or attitudes regarding price changes. The question whether prices can be changed after being published on the market was strongly

disputed. It would be an interesting research project to investigate the effects of pricing managers' beliefs regarding price changes on their efforts in price analysis and decision taking. It may be suspected that pricing managers who consider price changes impossible or damaging would invest more time and resources in price analysis. Yet, the distribution of pricing authority between pricing and sales might work against this effect.

Furthermore, the results of this thesis show that pricing teams should be carefully assembled according to their skills and their level of experience. A further avenue of research could follow up on this finding and investigate various configurations of pricing teams and the differences with respect to their pricing success. With the increasing professionalization of pricing, various roles and functions in the pricing center may develop, and it would be interesting to identify them, similar to the research on buying centers.

Moreover, this thesis researched price analysis across companies. Yet, the organization of the pricing function within the central pricing unit and the pricing units in subsidiaries opens new research topics: The Pricing Panel mentioned price harmonization as a major challenge; but the distribution of pricing power and the vertical transparency of information are also subjects that need much research.

12. Outlook

Pricing is highly analytical, requires outstanding networking skills within and outside the company, and is defined by conflicting goals and interdepartmental coordination requirements. Therefore, it is a company function that is crucial to company profits but often confronted with distrust, resistance, and skepticism. Therefore, in many B2B companies pricing has not found a real home yet. Pricing managers are often negatively affected by the divergence between everyone's opinion on the matter of prices and no one's responsibility for their consequences. Nevertheless, pricing managers keep fighting for more power and recognition. To do so, they have to establish their added value day by day, prove it to various stakeholders, and simultaneously professionalize their procedures. With efficient resource use, creative information solutions, the dissolution of data silos, and the availability of new automatic data processing tools (e.g., machine learning), many companies have started a wave of pricing professionalization that seems unstoppable.

From the experiences with pricing managers throughout this thesis, the author would describe pricing mainly as a coordination function. Yet, this opens a fundamental – and almost philosophical – discussion among pricing people and their organizations. Some agree with the coordination function, some refer to pricing as a support function delivering price analytics, and some would still say it is "an arcane subject, part black magic and part data science" (Kepes, 2013).

Since pricing is a relatively young role in B2B companies and pricing theory has only taken some initial steps towards understanding pricing practice, the author of this thesis hopes to inspire other researchers to further expand the highly relevant research on information behavior in pricing. And with the increasing use of technologies for pricing and the simultaneous increase of price transparency in B2B markets, pricing research at the intersection of theory and practice will become even more relevant in future.

13. Bibliography

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14. Appendix

A) Description of Participants

	Participant ID	Role	Industry	Date	Details
1	FSHG19	Head of Global Sales Pricing	Home Appliances	19.07.2019	Participant's offices & show room
2	PDTG19	CEO (focus on Pricing)	Food	11.02.2019	Participant's offices
3	HTG19	Product & Category Manager	Food	11.02.2019	Participant's offices
4	BBPW19	Pricing Manager	Wearables	10.05.2019	Phone
5	OWBS19	Head of product management, Integrator Business Europe	Security Systems	22.07.2019	Participant's offices
6	SCBP19	Retail Marketing / Pricing	Mechanical and electrical engineering (Tool production)	29.07.2019	Participant's offices
7	SDDS19	Head of Safety Segments Marketing	Safety Equipment Production	26.04.2019	Participant's offices
8	TSHT19	Head of Product Management	Mechanical and electrical engineering (Tool production)	11.07.2019	Participant's offices
9	JZGD19	Marketing Director	(Cyber) Security Systems and production	04.07.2019	HSG-IfM
10	CWTPF19	Central Business Unit Sales and Services	Sensor and Laser Tech	29.07.2019	Participant's offices & show room
11	RHCRH19	Pricing Manager	Construction Equipment	26.07.2019	Participant's offices

12	CVVA18	Global Head of Retail, CEO	Store Fittings, shop equipment and furnishings	13.12.2018	Participant's offices
13	MFGB2019	Pricing Manager	Home Appliances	20.11.2019	Participant's offices & show room
14	GICT2019	Head of Pricing PLT EMEA	Vehicle Equipment Production	30.08.2019	Phone
15	TSCT2019	Head of Pricing DACH	Vehicle Equipment Production	30.08.2019	Phone
16	HSST2019	Pricing Manager	Mechanical and electrical engineering (Tool production)	29.09.2019	Participant's offices
17	GDEC2019	Pricing Specialist & Trainer	Chemical Engineering	19.11.2019	Phone
18	PBSK2019	Pricing Specialist	Consulting	07.02.2019	Phone
19	MPPSK2019	Pricing Consultancy CEO	Consulting	06.02.2019	Phone
20	EBBE2019	Pricing Team	Mobility	2018	Field report
21	EB-MAN2019	Product Manager	Automotive	11.12.2019	HSG-IfM
22	DFBO	Pricing Manager	Chemicals	16.06.2020	Zoom
23	PMAB20	Head of Pricing	Motors & Generators	10.09.2020	Zoom
24	MUAB20	Head of Marketing & Sales	Motors & Generators	10.09.2020	Zoom
25	MKBA20	Benchmarking & Cost Engineering	Automotive	16.09.2020	Phone
26	SBVZ20	Senior Project Manager	Home Appliances	30.11.2020	Zoom
27	DWHV20	Managing Director	Ventilation Systems	11.12.2020	Zoom

28	FHGB20	Head of Pricing	Sanitary Facilities	17.12.2020	Zoom
29	BSZ21	Senior Group Pricing Manager	Ventilation Systems	15.06.2021	Microsoft Teams
30	DABÜ21	Senior Pricing Manager	Industrial Machines	10.10.2021	Microsoft Teams

B) Letter with Lead Questions for the Explorative Interviews in B2B-Pricing

Dear Sir or Madam,

thank you for your interest in and you support of my dissertation project!

The following selection of questions should be seen as indicative rather than final. It will help to guide us through our semi-structured expert interview, however, is open to any adjustments that are important during the conversation. The interviews will be registered for the purpose of this research project, however, they will not be published in combination with the interviewees' or companies' names. If we decide to extend the project to a case study with your company, you will be individually contacted and asked for permission.

1 Decision Makers and Stakeholders

Who is involved in the pricing process? Which decision makers take the widest influence in pricing? Which stakeholders have to be respected, monitored and satisfied in pricing (within and outside the company)? To whom does the pricing division report?

2 Information basis

Which drivers are decisive during the pricing process? Which pricing strategies are dominant? Which information is typically tangible and available? And which information have to be added, bought or estimated?

3 Practical Implications of Price Setting

When information is not accessible, what can be done to estimate or collect them? Are there strategic approaches to cost-/competition-/customer monitoring?

I am looking forward to our interview!

Best regards,

C) Code Book of In-Vivo-Coding and Re-Coding

Code	Comment	Code Group
Act on Information	An information is only valuable and should only be obtained if it influences or changes the decisional outcome.	Price Relevance Model
B2B/B2C	Differences between B2B and B2C business and pricing conditions	specific pricing circumstances
Bauchgefühl	Bauchgefühl im Pricing und dessen Einfluss auf das Pricing	Price Relevance Model
Bepreisung: Neuprodukt	The described pricing process refers to the pricing of a new product	specific pricing circumstances
Bepreisung: Preisanpassung	The described pricing process refers to the adaptation of a price	specific pricing circumstances
Causation	Types of heuristics, that rely on causal reasonings, i.e. that rely on traditional management measures, goal-oriented strategies of price analysis, risk averse, traditional management methods such as competitor maps.	typology of heuristics
Effectuation	Types of heuristics, that rely on effectual reasoning, i.e. that rely on resource-oriented strategies of price analysis, that aim to acquire information through new, out-of-the-box measures using resources consciously and benefit from existing ones.	typology of heuristics
endogener Faktor	The reason for the presence of a PRID is within the power and influence of the company/pricing manager.	Price Relevance Model
Erfahrung	Influence of experience on and within the pricing process	Price Relevance Model

exogener Faktor	The reason for the presence of a PRID is outside the power and influence of the company/pricing manager.	Price Relevance Model
Grund: Daten-qualität	Reason for PRID lies in data quality	Price Relevance Model
Grund: Druck von aussen	Reason for PRID lies in pressure from outside the company	Price Relevance Model
Grund: Druck von aussen (Kun-den)	Reason for PRID lies in pressure coming from customers	Price Relevance Model
Grund: Innova-tion	Reason for PRID lies in the product/service being an innovation	Price Relevance Model
Grund: interner (Zeit-)Druck	Reason for PRID lies in internal pressure, time pressure by colleagues and superiors	Price Relevance Model
Grund: Produkt-vielfalt	Reason for PRID lies in the large variety of products.	Price Relevance Model
Grund: recht-lich/external	Reason for PRID llies in legal restrictions and other external limiting factors	Price Relevance Model
Grund: Schweiri-gkeiten mit Tools	Reason for PRID lies in difficulties with existing or not existing tools	Price Relevance Model
Grund: Zeitdruck	Reason for PRID lies in time pressure during price analysis	Price Relevance Model
Grund: Ziel von GF	Reason for PRID lies in the goals formulated by the Board	Price Relevance Model
Informationsdefi-zit	Information deficit in the pricing process is named	Price Relevance Model, interruption of pricing process
Informationseffi-zienz	information efficiency is named as an important factor compared to information maximization	Price Relevance Model

Konkretes Defizit: Entwicklungskosten	Specific PRID at the time of price analysis: development costs	Price Relevance Model
Konkretes Defizit: Globale Listenpreise	Specific PRID at the time of price analysis: global list prices	Price Relevance Model
konkretes Defizit: Grund für verlorene Aufträge	Specific PRID at the time of price analysis: reason for lost orders	Price Relevance Model
Konkretes Defizit: Herstellkosten	Specific PRID at the time of price analysis: production costs	Price Relevance Model
konkretes Defizit: Kunden-/Konsumdaten	Specific PRID at the time of price analysis: customer and consumption information	Price Relevance Model
Konkretes Defizit: Lieferkosten	Specific PRID at the time of price analysis: delivery costs	Price Relevance Model
Konkretes Defizit: Nachfrage	Specific PRID at the time of price analysis: Demand	Price Relevance Model
konkretes Defizit: Preisbildungslogiken	Specific PRID at the time of price analysis: price setting logics	Price Relevance Model
Konkretes Defizit: Preisdurchsetzung	Specific PRID at the time of price analysis: price implementation	Price Relevance Model
Konkretes Defizit: Rabattstrukturen	Specific PRID at the time of price analysis: rebate and boni structures	Price Relevance Model
Konkretes Defizit: Risiko	Specific PRID at the time of price analysis: related risk	Price Relevance Model

Konkretes Defizit: Unternehmensstrategie	Specific PRID at the time of price analysis: company strategy	Price Relevance Model
konkretes Defizit: Value Proposition	Specific PRID at the time of price analysis: value proposition	Price Relevance Model
Konkretes Defizit: Wettbewerbspreise	Specific PRID at the time of price analysis: competitors' prices	Price Relevance Model
konkretes Defizit: WTP	Specific PRID at the time of price analysis: willingess to pay	Price Relevance Model
Markttransparenz	Expressions on market transparency and information barriers in the markets pricing managers operate in	typology of heuristics
Organisation: Austausch/Briefing	Pricing organization: Exchanges (calls, meetings etc.) and briefings within the organization and in relation to pricing topics	pricing organization
Organisation: Pricing im Sales	Pricing organization: organization and distribution of price authority to and organization of Sales units and Sales personnel	pricing organization
Organisation: Pricing pro BU	Pricing organization: expressions on the price authority and organization of business units and the decentral organzation of pricing in BUs	pricing organization
Organisation: Pricing pro Produkt	Pricing organization: expressions on the price organization per each specific product	pricing organization
Organisation: Pricing unit pro Zielmarkt	Pricing organization: expressions on the price authority and organization of market subsidiaries and the decentral organzation of pricing in BUs	pricing organization
Organisation: Teams	Pricing organization: expressions on the price authority and organization of single pricing teams and their organization	pricing organization

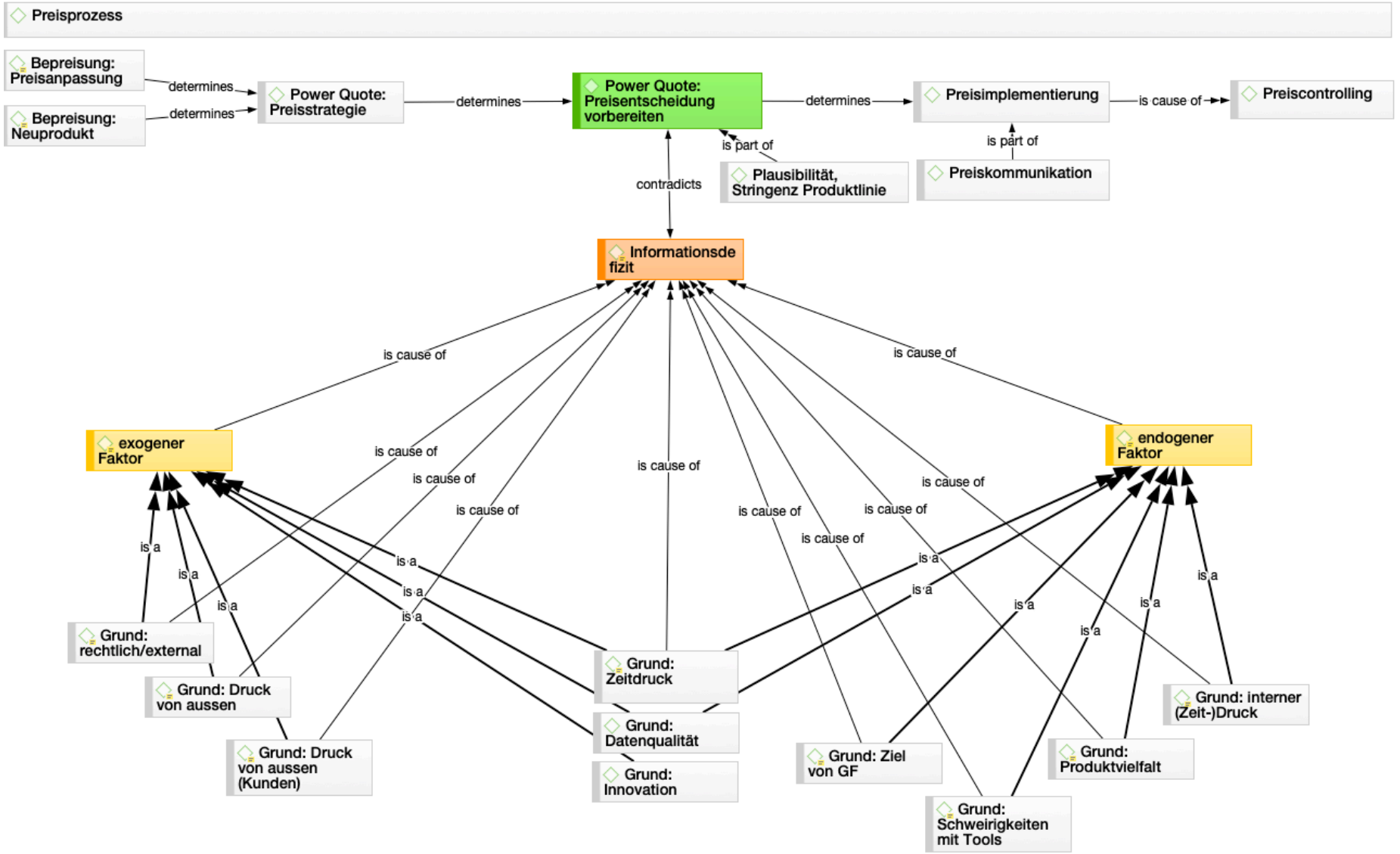
Organisation: übergeordnete Pricing Unit	Pricing organization: expressions on the price authority and organization in overarching pricing units responsible across products, BUs, and teams	pricing organization
Organisation: Zusammenarbeit Marketing/Pricing	Pricing organization: expressions on the price organization and collaboration between Marketing and Pricing	pricing organization
Organisation: Zusammenarbeit Sales	Pricing organization: expressions on the price organization and collaboration between Pricing and Sales	pricing organization
Organisation: Zuständigkeit des Pricing	Pricing organization: the tasks and objectives pricing managers are in charge of and the degree of pricing authority they hold	pricing organization
Organisationale Veränderung: Entscheidungslogik	Pricing organizational change: the pricing decision logic has changed, which exerts influene on pricing organization	pricing organization
Organisationale Veränderung: Mindset	Pricing organizational change: the pricing mindset has changed, which exerts influene on pricing organization	pricing organization
Organisationale Veränderung: Personal	Pricing organizational change: the personnel and its constellation/ team in pricing has changed	pricing organization
Organisationale Veränderung: Systeme	Pricing organizational change: the pricing systems have changed	pricing organization
Organisationale Veränderung: Wechsel Einheit	Pricing organizational change: the pricing unit has undergone organizational changes	pricing organization
Organisationale Veränderung:	Pricing organizational change: the pricing organization has become more centralized and a central unit has been installed	pricing organization

Zentralisierung (zentale Einheit)		
Organisationale Veränderung: Zuständigkeit	Pricing organizational change: the pricing responsibilities has changed, which exerts influene on pricing organization	pricing organization
Organizational Learning	The organization has addressed problems and challenges within pricing organization and let change follow their learnings.	pricing organization
Outer PRS	Information that is part of the outer price relevance sphere, which holds alternative and substitutive information	Price Relevance Model
Plausibilität, Stringenz Produktlinie	prices have to be arranged in order to be plausible and in accordance with the product line and the positioning of single products within the product line	Price Relevance Model
Power Quote: Markttransparenz schaffen	Companies address market transparency and aim to change their access to market information.	typology of heuristics
Power Quote: Preisentscheidung vorbereiten	The pricing unit prepares information for price decision takers. In this code their descriptions of said preparations, their understanding as decision preparators, and their strategies are captured.	pricing process
Power Quote: Preisrelevanzraum	an information addressing one stage of the price relevance sphere or the orchestration between price-relevance spheres	Price Relevance Model
Power Quote: Preisstrategie	pricing strategy of a company is discussed and/or implemented	pricing process
Power Quote: Theory/Practice	the difference and the divergence of pricing theory and pricing practices is named by interviewees	specific pricing circumstances
Power Quote: Typen	the interviewee addresses their way of bridging PRIDs and describes how they proceed	typology of heuristics

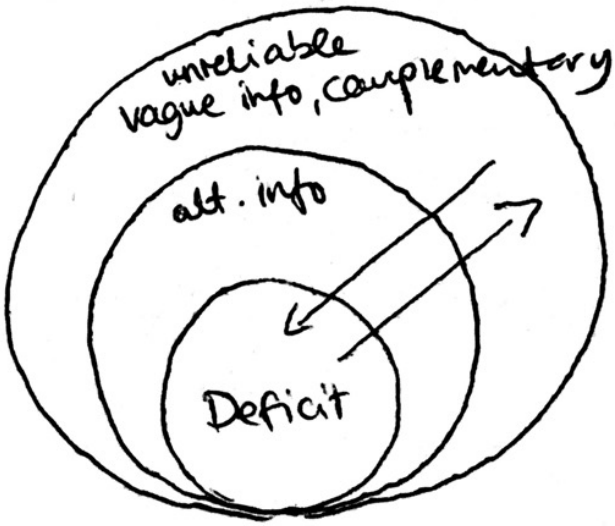
Preis-Relevanz-Raum	This code captures answers to the questions: Which information are present in price analysis? Which information do companies have at their disposal?	Price Relevance Model
Preisänderung	Pricing managers assess whether price changes are possible even after having published price lists and how they conduct price adjustments.	specific pricing circumstances
Preiscontrolling	Pricing controlling is one stage of the pricing process, therefore this code captures tasks and throughts with regard to this stage.	pricing process
Preisimplementierung	Price implementation is the stage between the pricing decision and price controlling. This code captures tasks and throughts with regard to the implementation of prices.	pricing process
Preiskommunikation	Price communication is part of the implementation process. This code captures tasks and throughts with regard to the communication of prices.	pricing process
Preisprozess	This code captures general expressions on the pricing process, its modalities and its real-life applications	pricing process
Problem: externe (Markt-)einflüsse	The problem with bridging a PRID lies in factors external to the company and/or the pricing team.	Price Relevance Model
Problem: Koordinierung mit anderen BUs	The problem with bridging a PRID lies in the coordination with other units of the dame company.	Price Relevance Model
Problem: Methode	The problem with bridging a PRID lies in the methodological competency available in and to the pricing unit.	Price Relevance Model
Problem: Wissens- und	The problem with bridging a PRID lies in the internal knowledge and information management.	Price Relevance Model

Informationsmanagement intern		
Problem: Zielkonflikt mit Unternehmens-/Pricingstrategie	The problem with bridging a PRID lies in a goal conflict between the pricing and the overarching company strategy.	Price Relevance Model
Projekt/Beratung	Pricing managers name the importance, the challenges and/or the effects of consultancy on pricing as well as internal (consultancy) pricing projects.	typology of heuristics, pricing process
Schätzung	Pricing managers name estimations as a piece of information in their relevant information set.	Price Relevance Model
Substitutive PRS	Information that is part of the substitutive price relevance sphere, which holds substitutive information, such as experience, gut feelings, valuable but less reliable information	Price Relevance Model
Typen	the interviewee addresses their way of bridging PRIDs and describes how they proceed	typology of heuristics
Typenwechsel	the interviewee addresses a change in their way of bridging PRIDs and describes how they proceed	typology of heuristics
Unterstützung Vorstand/Management Attention	The degree and the importance of management attention for pricing are named, described, and/or dicussed.	pricing organization
Validierung	The way pricing managers validate information, the degree of validity they expect from their information, their estimations on the validity of information sources and which behavior follows validity concerns.	Price Relevance Model
Verlässlichkeit Info	This code captures the degree of reliability managers attach to certain information or information sources	Price Relevance Model

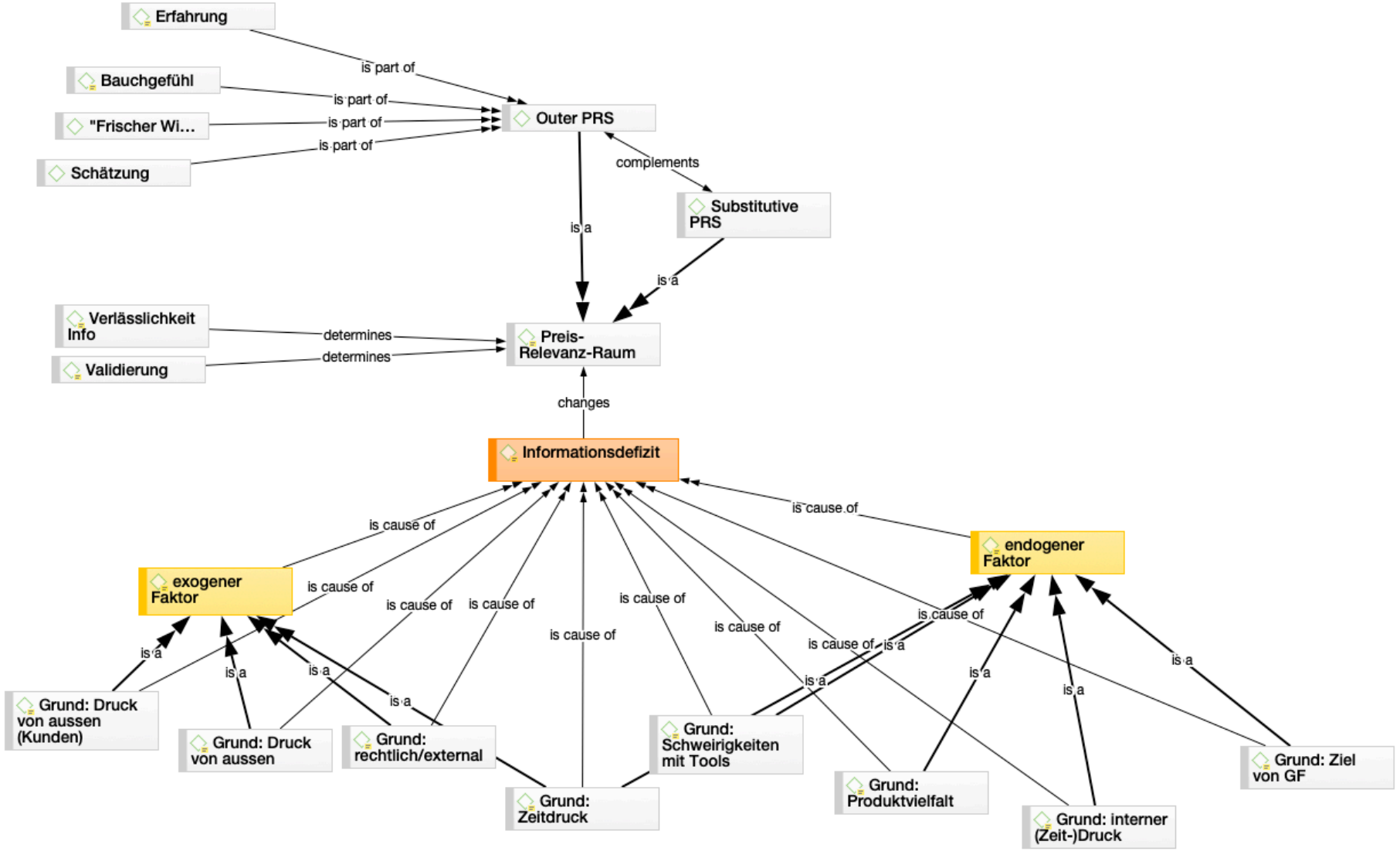
D) Memo of Pricing Process and Deviations due to PRIDs (Chapter 6)



E) First Memos from Coding Process of Chapter 6 (handwritten)



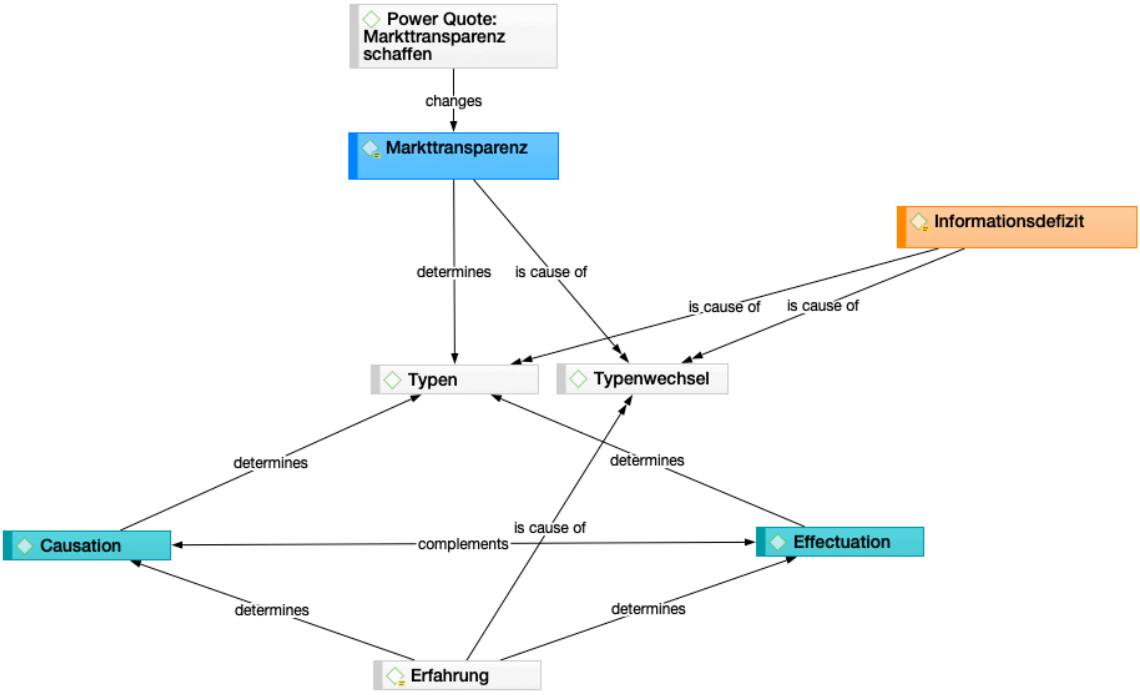
F) Memos of Price-Relevance Model (Atlas.ti Software)



G) Examples of Information in Price Relevance Model

	Example 1: Competition Prices	**Example 2: WTP of customers**	**Example 3: Specific production costs**
Inner price-relevance sphere	Price lists and discout structures of competitors	Value to the customer/ value of the customer	Fix and variable costs of a company
Outer price-relevance sphere	Hypotheses on margins, margin calculations, press releases with regard to price management and price changes, Backwards calculations from ingredient product to list price, verified and multiple registration of information on price points	Targeted information gathering in customer negotiations/conversations, Lead-customer interviews, demand calculations, value added assessment and specific value proposition, systematic analysis of product features, segmentation	Hypothesis of constant costs, development of resource costs, simulations of scenarios, costs of HR, yearly price increase, stock market
Substitutive price-relevance sphere	Single price point information, information from customer to Sales to Pricing, expert assessment of fair represenatations, deduction of price strategy from company strategy (e.g., penetration or skimming)	Estimations by sales and poduct development, estimation of probability to change of customers (through customer interactions)	Part costs, cross calculations from other Bus, scenarios of supply-demand-functions

H) Memo from Re-coding of Types of Heuristics (Atlas.ti Software, Chapter 7)



I) Addition to Quantitative Data (Chapter 8 and 9)

I.i. Overview on Constructs in Chapter 8

Involvement in price decision-making		
Regarding the product you are referring to, have you been engaged in any kind of activities related to price-decision making (supporting activities included)?		
Option 1	Yes.	
Option 2	No.	
Pricing capabilities (PC)		
How do you evaluate your pricing capabilities?		
PC1	Using pricing skills and systems to respond quickly to market changes	Liozu & Hinterhuber (2013)
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 the price list and minimizing discounts.	
PC6	Quantifying customer's willingness to pay.	
PC7	Measuring and quantifying differential economic value versus competition.	
PC8	Measuring and/or 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 programms.	
PC12	Developing proprietary internal price management processes.	
PC13	We have never adjusted price list due to erroneos prices.	Additional
PC14	In the event of price changes, the corresponding adjustment effort was minimal.	Additional
Product Newness		
With regards to the product launch, the product/service was...		
Option 1	New to the market & new to the company (e.g., 'new-to-the-world' products)	Based on Booz, Allen & Hamiton (1980) in Combination with Sarasvathy (2008)
Option 2	New to the market & familiar to the company (e.g., repositionings)	
Option 3	Familiar to the market & new to the company (e.g., new product lines/ additions to existing product lines)	
Option 4	None of these.	
Product Advantage (PA)		
How do you estimate the relative advantages of this product/service as compared with competitor's products/services, for...		Ingenbleek et al. (2013)

PA1	Product/service quality.	
PA2	Expressing trustworthiness and expertise.	
PA3	Reliability of the product/service.	
PA4	Overall advantage of the product/service.	
Competitive Intensity (CI)		
Please indicate how much you agree with the following statement.		
CI1	Competition in our industry is cutthroat.	Jaworski & Kohli (1993)
CI2	There are many «promotion wars» in our industry.	
CI3	Anything that one competitor can offer, others can match readily.	
CI4	Price competition is a hallmark in our industry.	
CI5	One hears of a new competitive move almost every day.	
CI6	Our competitors are relatively strong.	
Market Transparency (MT)		
How do you evaluate the information access with regards to		
MT1	Competition?	Additional
MT2	Market data?	
MT3	Cost trends?	
MT4	Customer needs	
MT5	General conditions.	
Startup experience (SE)		
Please indicate how much you agree with the following statement.		
SE1	Members of the team have previously worked in startups for a long period of time.	

SE2	Members of the team have previously worked in responsible positions in startups.	Adapted form Frese (2014)
SE3	Our team had a sound founding experience during the pricing processes.	

Management experience (ME)		
Please indicate how much you agree with the following statement.		
ME1	Members of the team have previously worked in classic management functions for a long period of time.	Adapted form Frese (2014)
ME2	Members of the team have previously worked in responsible positions in classic management functions.	
ME3	Our team had a sound management experience during the pricing processes.	
Time Pressure (TP)		
Please indicate how much you agree with the following statement.		
TP1	We were under a lot of pressure to complete our pricing tasks on time.	Adapted from Maruping et al. (2015)
TP2	We were not afforded much time to complete our pricing tasks.	
TP3	The amount of time to complete our pricing tasks was short.	
TP4	Task durations were often short.	
Causation (C)		
Please indicate how much you agree with the following statemnet.		
C1	We analysed long-run opportunities and selected what we thought would provide the best results.	Adapted from Chandler et al. (2011)
C2	We developed a strategy to best take advantage of resources and capabilities within our company.	
C3	We designed and planned pricing strategies.	

C4	We organised and implemented control processes to make sure we obtained the necessary information.	
C5	We have conducted a detailed analysis of the internal information situation and decided on certain necessary and sufficient information for price decision-making.	
C6	We had a clear and consistent idea what we wanted to achieve with the task of price information analysis.	
C7	We have carefully planned measures for information gathering and management in advance.	
Effectuation (E)		
Indicate how the following statements apply to you.		
BH1	We have developed the price-relevant information analysis based on existing resources.	Adapted from Küpper (2010)
BH2	The price-relevant information analysis was mainly based on existing resources.	
BH3	Existing resources have strongly influenced the extent of our price-relevant information analysis.	
BH4	Existing resources were rather the starting point of our information analysis.	
AL1	The decision-making within the price analysis was mainly based on risk minimization (or cost limitation respectively).	
AL2	Considerations of a possible (net) loss were decisive for information gathering and analysis.	
AL3	Decisions on financial expenditures within information gathering were primarily based on potential risks of loss.	
CQ1	We have actively approached potential stakeholders/partners in order to jointly make future developments easier to control.	
CQ2	To reduce risks, we have promoted cross-divisional coordination and streamlined intersections.	

LE1	We always reacted to surprising events – if necessary, the price list was adjusted.	
LE2	The planning of the informations analysis was primarily conducted in small steps during implementation.	
LE3	Apparent information gaps or (time) pressure on decision-making were used to our advantage wherever possible.	
PP1	(Before setting up a pricing department), we have largely forgone comprehensive analyses of market information.	
PP2	With our pricing team, we didn't rely on already established pricing processes, we rather built our own.	
PP3	The focus on pricing was more about the development of an own pricing process than about the information gathering methods of other departments/companies.	
PP4	We did not foresee the direction of information and price development in our market; we rather initiated or forced the developments.	
PP5	We did not adopt any already established/external pricing processes because we felt that we had control over future developments throughout being a direct driver of them.	
Firm size		
Please state the number of employees in your company/organization.		
Option 1	0-9	Based on European Commission (2015)
Option 2	10-49	
Option 3	50-249	
Option 4	>250	
Market type		
In which market type was your product placed?		
Option 1	Business markets.	

Option 2	Consumer markets.	Ingenbleek et al.
Option 3	Both (e.g., as a platform)	

Control variabel: **Product type**		
What type of product have you referred to?		
Option 1	Durable	Ingenbleek et al. (2013)
Option 2	Consumable	
Control variable: **Product type**		
What type of product have you referred to?		
Option 1	Physical product	Ingenbleek et al. (2013)
Option 2	Service	
Exogenous shocks		
During the product launch, have there been any exogenous shocks that influenced you price decision-making significantly (such as oil crisis, COVID-19)?		Additional
Option 1	Yes.	
Option 2	No.	

I.ii. Overview on Internal Consistency of Constructs in Chapter 9

Construct	No. of items	Cronbach's Alpha	Lower Boundary	Upper Boundary
Pricing Capabilities	12	0.88	0.84	0.91
Capabilities (company)	4	0.8	0.74	0.86
Capabilities (market)	4	0.76	0.68	0.83
Capabilities (customer)	4	0.66	0.55	0.77

Product Advantage	4	0.83	0.78	0.89
Competitive Intensity	6	0.73	0.66	0.81
Start-Up Experience	3	0.76	0.68	0.84
Management Experience	3	0.85	0.8	0.9
Time Pressure	4	0.88	0.84	0.92
Causation	7	0.83	0.79	0.88
Effectuation (BH)	4	0.85	0.81	0.9
Effectuation (AL)	3	0.79	0.72	0.86
Effectuation (CQ)	2	0.73	0.63	0.83
Effectuation (LE)	3	0.55	0.41	0.69
Effectuation (PP)	5	0.74	0.66	0.82
Effectuation (tot)	17	0.8	0.75	0.86

Confidence boundaries: 95%

I.iii. Overview on Survey-Questions in Chapter 9

Nr.: 1

Welcome to our study on information in price setting!

This survey will take you approx. 15 min. Your data is not being tracked and your answers are saved anonymously.

For every participant we will donate 5 CHF to "Winterhilfe Schweiz" for their projects helping people in need especially during winter time!

We appreciate your support!
Kind regards,
Iris Schmutz

Nr.: 2 What is your relationship to the pricing function?

- ○ I am currently working in pricing.
- ○ I have worked in pricing.
- ○ I have/had insights into the pricing of my company.
- ○ I have no direct or indirect relationship with the pricing function.

Nr.: 3

For the purpose of this survey, think of the pricing function in your current or previous company.

The first part of this survey covers some general questions.

Nr.: 4 In which steps of the pricing process are you involved?

- ☐ Price strategy (e.g. price objectives, positioning, price targets)
- ☐ Price analysis (e.g. collecting data/information, market analysis)
- ☐ Price decision (e.g. define list prices, rules for rebate system, pricing tactics)
- ☐ Price controlling (e.g. check price implementation, price adjustments)

Nr.: 5 In which market type does your company mainly operate?

- ○ Business markets/B2B
- ○ Consumer markets/B2C
- ○ Both (e.g. as a platform)/B2B2C

Nr.: 6 What type of products are at your core business?

- ○ Physical products
- ○ Services

Nr.: 7 On which management level are you working?

- ○ Top management/C-level
- ○ Middle management
- ○ First-line management
- ○ Employee
- ○ other:

Nr.: 8 Competitive intensity

	I strongly disagree	I disagree	neutral	I agree	I strongly agree
Competition in our industry is cutthroat.	○	○	○	○	○
There are many «promotion wars» in our industry.	○	○	○	○	○
Anything that one competitor can offer, others can match readily.	○	○	○	○	○
Price competition is a hallmark in our industry.	○	○	○	○	○

One hears of a new competitive move almost every day.	○	○	○	○	○
Our competitors are relatively strong.	○	○	○	○	○

Nr.: 9 Experience

	I strongly disagree	I disagree	neutral	I agree	I strongly agree
Members of the pricing team have previously worked in startups for a long period of time.	○	○	○	○	○
Members of the pricing team have previously worked in classic management functions for a long period of time.	○	○	○	○	○

Nr.: 10 Please state the estimated number of employees in your company/organisation.

- ○ 0-9
- ○ 10-49
- ○ 50-249
- ○ >250

Nr.: 11 In which country are you based?

- ○ Switzerland
- ○ Germany
- ○ Austria
- ○ other:

Nr.: 12

Second part:
The second part of this survey covers some questions with regard to the pricing organization and function within your company or the company you are referring to.

Nr.: 13 Formalization

	very strongly disagree	strongly disagree	disagree	neutral	agree	strongly agree	very strongly agree
Responsibility for pricing decisions has been clearly assigned to organizational individuals in our firm.	○	○	○	○	○	○	○
Within our organization, formal internal communication channels are followed when working on pricing.	○	○	○	○	○	○	○
In our firm, the rationale for pricing decisions is well documented and filed for future reference.	○	○	○	○	○	○	○
To coordinate the parts of our organization working in pricing, standard operating procedures have been established.	○	○	○	○	○	○	○
People in our company understand the importance of (consistent) pricing.	○	○	○	○	○	○	○

Nr.: 14 Centralization

	very strongly disagree	strongly disagree	disagree	neutral	agree	strongly agree	very strongly agree
Important pricing decisions have to be referred to someone higher up for a final answer.	○	○	○	○	○	○	○
People involved in important pricing decisions have to ask their boss before they do almost anything.	○	○	○	○	○	○	○
Employees making important pricing decisions need to have the boss' approval first	○	○	○	○	○	○	○
Managers generally make important pricing decisions only after checking them with someone on the management team.	○	○	○	○	○	○	○

Nr.: 15 Specialization

	very strongly disagree	strongly disagree	disagree	neutral	agree	strongly agree	very strongly agree

Now we will present you a price setting scenario. Please read through it thoroughly and answer the related questions.

Nr.: 20

Imagine it is a normal year of business, no pandemic crisis, no fear of potential lockdowns. Your team is in charge to price a new product, which will add to your existing product lines. Although competitors work on similiar products, yours is in some aspects significantly different from the competitors' products. In order to benefit from a first-mover advantage, your company wants to launch the product on the next fair, which will take place within the next month. By then the list prices must be defined and price lists printed.

Information at your disposal:
For your report to the price decision takers, you would like to include information on the competitive environment, this product faces when launched. Competitors' price lists are, however, sealed due to competition law. Therefore, you are in constant contact with your company's sales personell. They have quite a good idea about your products' performance with regard to competition on the market. You were able to document most of the competition prices they told you and in sum they draw a picture of the competitive environment for the new product, that you have been asked to price.

Proposal:
One of your team members suggests to further investigate competitors' potential prices by additional calculations: Your colleagues from the business intelligence units could help you, to estimate competitors' prices based on different assumptions of competitors' margins.

Nr.: 21 To what extent can you identify with the presented scenario?

- ○ I can't identify at all.
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ I can fully identify.

Nr.: 22 If you had to decide upon this proposal, how likely would it be, that you would try this additional method in order to gain more information on competition prices?

- ○ very unlikely
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ very likely

Nr.: 24 What is your favorite pricing strategy?

- ○ Value-based pricing
- ○ Cost-based pricing
- ○ Competition pricing
- ○ other
- ○ note

In our organization there are “ pricing specialists” who direct their efforts to price management.	○	○	○	○	○	○	○
Standardized training procedures exist for jobs that involve pricing activities.	○	○	○	○	○	○	○
Written position descriptions are provided to pricing specialists.	○	○	○	○	○	○	○

Nr.: 16 Top-management involvement

	very strongly disagree	strongly disagree	disagree	neutral	agree	strongly agree	very strongly agree
Our top management considers efforts to improve price management to be a valuable investment of resources.	○	○	○	○	○	○	○
Our top management considers our pricing activities as a critical success factor.	○	○	○	○	○	○	○
Our top management intends to increase the company's pricing awareness.	○	○	○	○	○	○	○

Nr.: 17 Pricing process adaptability

	very strongly disagree	strongly disagree	disagree	neutral	agree	strongly agree	very strongly agree
We adapt our pricing approach quickly to the changing needs of customers.	○	○	○	○	○	○	○
We use our pricing to react quickly to new market threats.	○	○	○	○	○	○	○
We use our pricing to quickly exploit new market opportunities.	○	○	○	○	○	○	○

Nr.: 18 Innovation

	very unimportant			neutral			very important
All employees are receptive to ideas for change.	○	○	○	○	○	○	○
The firm keeps up with technological advances.	○	○	○	○	○	○	○
The company is receptive to change.	○	○	○	○	○	○	○

Nr.: 19

Third and last part:

Now we will present you a price setting scenario. Please read through it thoroughly and answer the related questions.

Nr.: 20

Imagine it is a normal year of business, no pandemic crisis, no fear of potential lockdowns. Your team is in charge to price a new product, which will add to your existing product lines. Although competitors work on similiar products, yours is in some aspects significantly different from the competitors' products. In order to benefit from a first-mover advantage, your company wants to launch the product on the next fair, which will take place within the next month. By then the list prices must be defined and price lists printed.

Information at your disposal:
For your report to the price decision takers, you would like to include information on the competitive environment, this product faces when launched. Competitors' price lists are, however, sealed due to competition law. Therefore, you are in constant contact with your company's sales personell. They have quite a good idea about your products' performance with regard to competition on the market. You were able to document most of the competition prices they told you and in sum they draw a picture of the competitive environment for the new product, that you have been asked to price.

Proposal:
One of your team members suggests to further investigate competitors' potential prices by additional calculations: Your colleagues from the business intelligence units could help you, to estimate competitors' prices based on different assumptions of competitors' margins.

Nr.: 21 To what extent can you identify with the presented scenario?

- ○ I can't identify at all.
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ I can fully identify.

Nr.: 22 If you had to decide upon this proposal, how likely would it be, that you would try this additional method in order to gain more information on competition prices?

- ○ very unlikely
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ very likely

Nr.: 24 What is your favorite pricing strategy?

- ○ Value-based pricing
- ○ Cost-based pricing
- ○ Competition pricing
- ○ other
- ○ note

Nr.: 25

A second scenario:

Again, you are asked to price a new product and print price lists within one month (due to the upcoming fair date). You have already questioned your company' s sales personell with regard to the willingness to pay of customers for this specific new product. You also compared this information with data from market research on customer needs concerning your product type.

Proposal:
Another one of your colleagues suggests to further investigate the willingness to pay by merging openly accessible sales data of market players (e.g. market shares), data on competitors' brand values as well as consumer trend data. Afterwards you could statistically evaluate this data set in order to find drivers of willingness to pay and segment your customers.

Nr.: 26 To what extent can you identify with the presented scenario?

- ○ I can't identify at all.
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ I can fully identify.

Nr.: 27 If you had to decide upon this proposal, how likely would it be, that you would try this additional method in order to gain more information on your customers' WTP?

- ○ very unlikely
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ very likely

Nr.: 29

Thank you very much for participating! We will donate 5 CHF to "Winterhilfe Schweiz" for your answers!

If you are interested in the study results, feel free to contact me via e-mail (iris.schmutz@unisg.ch).

I.iv. Results from Logistic Regression Results (Chapter 9)

The first table shows the logistic regression results from the analysis of scenario 1. The subsequent table shows the corresponding results from the analysis of scenario 2.

	Logistic Regression Scenario 1 (n=177)								
	Model 2a	Model 2a	Model 3a	Model 4a	Model 5a	Model 6a	Model 7a	Model 8a	Model 9a
Intercept	1.692* 0.761	3.104*** 0.876	1.99* 0.795	1.875* 0.77	-4.199° 2.198	-2.307 1.651	-2.405 1.649	1.926* 0.799	0.158 0.915
CH2 (We are usually not able to react that fast to changes)							0.764° 0.408		
CH 4 (We do not have the proper tools to conduct such measures)	-0.231* 0.105				1.014* 0.499				
CH 5 (The probability of positive effects of additional measures is too small.)		-0.567*** 0.136							
CH6 (We have difficulties calculating the economic value of our						0.651° 0.35			

product versus the competition.)									
CH 8 (This additional action is not normally included in our internal pricing processes.)			-0.293* 0.115						
CH 10 (This additional information will not be valued by decision takers.)				-0.329* 0.129					
CH 11 (Such additional measures are a strategic decision, not an operative pricing decision.)									0.129 0.136
CH13 (We don't have time to experiment.)								-0.336* 0.139	
Centralization					1.235** 0.438				
Management Experience						0.977*	0.840*		

						0.426	0.421		
Management Level “Employee”									6.83 4.607
CH2*Management Experience							-0.195° 0.111		
CH 4* Centralization					-0.261* 0.102				
CH6*Management Experience						-0.212* 0.098			
CH11*Employee									-2.187° 1.30
CH13*B2C								0.696** 0.244	
AIC	255.33	240.3	253.49	253.46	250.23	257.73	259.43	252.77	269.08

Control Variables	Not sig.	B2b* (-0.981)	B2b° (-0.845)	B2b° (-0.893)	Not sig.	B2b° (-0.846)	Medium size° (-0.104)	B2C** (-2.907), B2b° (-0.798)	Not sig.

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '°' 0.1

	Logistic Regression Scenario 2 (n=157)								
	Model 1b	Model 2b	Model 3b	Model 4b	Model 5b	Model 6b	Model 7b	Model 8b	Model 9b
Intercept	2.8033*** 0.8188	1.8519*** 0.7138	3.4008*** 0.9067	0.2951 1.2764	-0.66798 1.49281	-4.1442 2.6479	-2.9254 2.4712	-0.61633 1.43923	0.50123 1.13718
CH2 (We are usually not able to react that fast to changes)								0.54822 0.35847	
CH 4 (We do not have the proper tools to conduct such measures)						1.1226° 0.5860			
CH 5 (The probability of positive effects of additional measures is too small.)	-0.6303*** 0.1498		-0.5320*** 0.1578	0.4238 0.3543					
CH6 (We have difficulties calculating the economic value of our product							1.0111° 0.5928		

versus the competition.)									
CH 10 (This additional information will not be valued by decision takers.)		-0.4401*** 0.1290	-0.2911* 0.1390						
CH 11 (Such additional measures are a strategic decision, not an operative pricing decision.)				0.891** 0.3371	0.39018 0.33688				
CH 13 (We do not have time to experiment.)									0.257 0.29018
Pricing Process Adaptability					0.40819 0.29818			0.47364 0.30528	
Formalization						0.8848° 0.4735	0.7035 0.4280		
Specialization									0.28198

									0.28864
CH2*Pricing Process Adaptability								-0.17160* 0.08179	
CH4*Formalization						-0.220* 0.1096			
CH5*CH11				-0.312** 0.1044					
CH6*Formalization							-0.2239* 0.1140		
CH11*Pricing Process Adaptability					0.125° 0.07308				
CH13*Specialization									-0.131° 0.07941
AIC	197.79	205.78	195.28	191.09	217.29	218.3	217.37	215.99	215.55

Control Variables	Medium size** (-2.03)	Medium size** (-1.816)	Medium size** (-2.013)	Medium size** (-1.917)	Medium size** (-1.938)	Medium size** (-1.827)	Medium size** (-1.803)	Medium size** (-1.92)	Medium size** (-1.79)

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '°' 0.1

14.1. Curriculum Vitae

Education

Since 04/2018 ***Ph.D. Program in Management (PMA) at the University of St. Gallen (CH)***

Research field of thesis: *Information Behavior in b2b price setting*

Applied methods: qualitative case/interview analysis, Grounded Theory, correlation analysis, advanced regression analysis, Qualitative Comparative Analysis (QCA)

Tools: ATLAS.ti, R, Mendeley, Unipark

Special achievement: founding and assembling a pricing panel with industry partners, which in exchange for latest research insights participates in studies of the Institute

10/2015 – 04/2018 ***M.Sc. European Management:*** **Double degree at the Eberhard-Karls-Universität Tübingen (D) and the Università degli Studi di Pavia (IT)**

Thesis: *"Competitive Price Monitoring - An Application of Hedonic Pricing Models for Bosch eBike Systems"*

Applied methods: multiple regression models (hedonic, ridge), tree-based models, correlation analysis, multicollinearity solutions

Tools: STATA, R

Scholarship: DAAD Germany

Grade: 1.7 (German grade system), 110/110 „con lode" (Italian grade system)

30/09/2014 **Dean's List Award of High Academic Success and Achievement**, awarded by the Faculty of Economics and Management of the Free University of Bolzano

09/2011 - 11/2014 ***B.Sc. Economics and Social Sciences at the Free University of Bolzano***

Trilingual: English, German, Italian

Thesis: "*Alternative Parties in Europe - Political Apathy, Shifting Values or Right-Wing Populism"*

Grade: 1.7 (German grade system), 107/110 (Italian grade system), 5.75 (Swiss equivalent)

Foreign exchange:

- *National Sun Yat-Sen University in Kaohsiung, Taiwan* (ROC) (1 semester with scholarship of the University of Bolzano)
- *Università di Torino, Italien* (1 semester)
- *Renmin University of China in Peking, China* focusing on political science (summer school 2014)

Work Experience

02/2022 – today **Pricing Manager** at Hilti AG

03/2018 – 02/2022 **University of St.Gallen** (Doctoral Research Associate)

- Chief Management Officer of the journal Marketing Review St. Gallen (e.g. acquisition and assessment of papers, management of review process, project management, care for industry partners)
- Management education in the fields of Marketing Management and Pricing
- "Best-Practice in Marketing" (bench-learning program with industry partners): content management and coordination, workshops, consulting, and applied research projects
- Executive Study Trips (e.g. Tel Aviv focusing on innovation and business culture)

01/08 - 30/11/2017 **Market Analysis and Pricing** at Bosch eBike Systems (thesis student)

- Pricing Analytics
- Statistical support to the Pricing team
- Model development for the estimation of competition prices

07/04-31/07/2015 **Market development and expansion** at the German Chamber of Commerce (AHK) Milano, Italy (internship)

- Market analysis for industrial partners of diverse sectors
- „Business Matching" between German and Italian companies
- Preparation, briefing and moderation of business meetings between international companies

24/11/2014-13/02/2015 **Foreign economic affairs** at the department of the German Federal Foreign Office in Taipei, Taiwan (internship)

- Analysis of market situations and their political impacts
- Researching and writing reports for topics of specific political and economic interest for the country of Germany
- Representation of the German delegation at conferences etc.
- Preparation and implementation of state visits

02/07-30/09/2012 **Marketing Consultancy**, Impact IRC, Nürnberg (D) (internship)

- Reporting and Monitoring for customers (e.g. telecommunications and insurance business)
- Re-brandings and brand guidelines
- Coordination of consumer surveys and following analytics

01/07-31/08/2011 **Public Relations** at the chamber of industry and commerce Heilbronn-Franken (internship)

- Member magazine „w.news" (texting, reportings, illustration)
- Preparation and briefings of public performances of the Board
- Daily press review

2010-2014 **Newspaper Journalism** for the „Stuttgarter Nachrichten" (editorial intern and subsequently freelance journalist)

- Author journalistic articles
- Edit and assemble content