The scope of price promotion research: An informetric study☆

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ABSTRACT

Price promotions are an essential element of a company's marketing policy because they affect sales, profits, and key intangible assets, such as brand equity. Recognizing their importance, research has accumulated an extensive and diverse amount of knowledge. This study facilitates access to the complex price promotion literature, enabling managers and researchers to more effectively capitalize on extant scientific insights. The authors apply a unique combination of quantitative bibliometric analysis and text-mining techniques to contribute a fresh, domain-neutral, and objective review of price promotion research published in 1165 journal articles from 1980 to 2013. The results provide a structured overview of the field's main research streams, their most influential works and key insights, their intellectual connections, and their temporal evolution. A discussion of the findings reveals potential for future research endeavors.

1. Introduction

Price promotion appears, at first sight, to be a simplistic marketing topic. When a product is on promotion, potential buyers typically infer that the product is available at a lower price than usual. Accordingly, Blattberg, Briesch, and Fox (1995, p. 122) define price promotions as "temporary price discounts offered to a customer." Promotions' impact, however, can be complex and far-reaching as the following example illustrates. The U.S. retailer J.C. Penney implemented an everyday low price (EDLP) strategy, which removed temporary discounts and coupons to cut costs and increase store traffic (Ofek & Avery, 2012). The strategy ultimately failed, creating a drastic drop in revenues and profits. Among the various reasons was J.C. Penney's shortcoming to account for the psychological effects of the strategic change. Over the years, the firm conditioned its shoppers to value the excitement of getting a deal. As a result, shoppers perceived the EDLP as less valuable than a large but temporary discount and avoided the retailer's stores. Although current research attests to the positive effects of EDLP strategies (e.g., Danziger, Hadar, & Morwitz, 2014), the case of J.C. Penney shows that, in reality, promotional decisions can be more complex than scientific experiments would suggest.

Ample research exists on the positive and adverse effects of price promotions. Studies reveal that promotions not only influence companies' revenues (e.g., Pauwels, Hanssens, & Siddarth, 2002) and profits (e.g., Jedidi, Mela, & Gupta, 1999) but also affect crucial intangible assets, such as brand equity (e.g., Buil, de Chernatony, & Martínez, 2013) and brand loyalty (e.g., Gedenk & Neslin, 1999). Given the variety and complexity of effects, both researchers and managers can benefit from capitalizing on existing scientific findings. One major hurdle, however, is the complex and rich body of literature, which causes difficulty for non-experts in detecting insights applicable to their specific problem.

Facilitating access to highly relevant but complex scientific knowledge is a tedious but indispensable task. Thus, the purpose of this study is to provide an overview of the major price promotion research streams, their main findings and most influential works, their intellectual connections, and their temporal evolution. To achieve this goal, the study adopts an informetric research approach. Informetrics refers to the quantitative measurement and modeling of information in any form encompassing, among others, the narrower fields of bibliometrics, scientometrics, and quantitative linguistics (Egghe & Rousseau, 1990). Compared with a classic literature review, a major advantage of bibliometrics is its use of objective quantitative techniques to avoid potential subjective biases introduced by the researcher (Ferreira, Santos, de Almeida, & Reis, 2014; Ramos-Rodríguez & Ruíz-Navarro, 2004).

Existing studies acknowledge this benefit and successfully apply bibliometric analysis to identify research streams within a scientific field (e.g.Acedo & Casillas, 2005; Nerur, Rasheed, & Natarajan, 2008). However, when characterizing the streams' themes, they typically rely on manual inspection of publications' abstracts, keywords, or full texts. The present paper further strengthens bibliometrics' main advantage by applying quantitative text mining to support a more objective interpretation of the discourses' content.

This approach contributes to a fresh, domain-neutral, and objective perspective on the research landscape and extends prominent reviews on price promotion literature (Blattberg & Neslin, 1989; Blattberg et al., 1995; Neslin, 2002) that share several limitations. These reviews adopt a distinct marketing perspective, appear in marketing journals (i.e., *Marketing Letters* and *Marketing Science*) or in dedicated marketing books (i.e., *Handbook of Marketing*), and stem from established authors in the marketing discipline. Furthermore, the last prominent review appeared more than a decade ago and thus may not reflect recent developments. This paper explores both recent and past price promotion researches with a quantitative, and thus less subjective, approach without narrowing the view on a particular research domain. Thereby, this research complements the work of Leone, Robinson, Bragge, and Somervuori (2012), who perform a descriptive citation and profiling analysis within the considerably broader field of pricing. Although these authors do not provide specific insights into price promotion research, they stress the subject's relevance, as promotion ranked fourth among the most important topics in pricing. This finding underscores the need for a dedicated evaluation of price promotion research.

By examining this relevant area, the paper offers substantial benefits for both researchers and practitioners. The paper fulfills an encyclopedia function by providing a compact overview of the field's major discourses, findings, and publications. Furthermore, holding up a mirror to price promotion researchers, the paper reveals the field's major schools of thought and measures their knowledge exchange. This assessment helps identify silo mentalities, broadens the research communities' perspectives, and uncovers white spots on the research map that serve as starting points for future research avenues.

2. Methodology

The informetric approach adopted involves the following steps: we create the data basis by identifying scientific articles that represent price promotion research. Then, we briefly introduce informetric techniques to analyze the cited references and abstracts of the article database. Next, we provide a micro-view on the research landscape using co-citation analysis, factor analysis, and text mining to detect research streams, describe their representative publications and dominant topics, and summarize their main insights. Finally, we analyze the entire research system from a meta-view to examine the streams' differences, uncover their inter-relationships (using social network analysis), track their evolution over time, and offer a starting point for future research avenues.

2.1. Data basis

In accordance with proven practice in informetric analysis (e.g. Leone et al., 2012, Ramos-Rodríguez & Ruíz-Navarro, 2004), the Social Sciences Citation Index serves as the data source. We performed a three-step process involving search term definition, article extraction, and data cleaning to identify publications that represent the predominant body of literature in price promotion research from 1980 to 2013. We refer to the resulting 1165 articles as "publication sample" in the remainder of the study. The 22,405 works referenced (i.e., cited) by the publication sample constitute the intellectual basis of price promotion research and are subsequently called "reference sample."

Web Appendix A provides details on the retrieval process and a descriptive analysis of the extracted database. Specifically, the Appendix presents the top 10 influential scientific journals per research domain, the top 20 cited authors, and the top 20 referenced publications in price promotion research.

2.2. Analysis techniques

Performing co-citation analysis on the reference sample paves the way for detecting research streams (i.e., discourses). According to

Small (1973), co-citation analysis reveals publications' similarity or association by measuring the frequency with which two articles are cited together. High co-citation counts indicate that two publications are jointly relevant for a scientific discourse from the perspective of a considerable number of authors. Accordingly, co-citation analysis is a widespread and successful tool to investigate the intellectual structure of an academic field (White & Griffith, 1981). Following proven practice (White & McCain, 1998), this study uses a major output of co-citation analysis—namely, the co-citation matrix—as input for factor and network analyses.

Factor analysis is a commonly used technique to identify research streams within a scientific field (McCain, 1990; Nerur et al., 2008). A symmetric co-citation matrix containing the co-citation counts of the relevant publication set constitutes the database. Factor analysis evaluates the co-citation structure and groups frequently co-cited articles into factors. These factors represent scientific discourses (i.e., research streams) based on the premise that frequent co-citations indicate sharing of common ideas (latent elements). This method also provides numerical indicators to detect representative and influential publications within discovered discourses. Publications' factor loadings reveal how well an article fits into a specific stream—that is, how representative the article is for a scientific discourse (Nerur et al., 2008). Publications' factor scores indicate how strongly a contribution influences a stream—that is, how important the contribution is for a discourse (Teichert & Shehu, 2010). Observations in which relative sizes of loadings and scores significantly deviate are of particular interest. A publication that is, for example, not representative of a discourse but exerts a high influence can be identified as basic research work that is relevant over and above the specific research stream.

Textual data mining, or briefly text mining, is a computer-aided technique used to gain meaningful knowledge from large text collections (Losiewicz, Oard, & Kostoff, 2000). This study uses the text-mining software Leximancer to extract important lexical terms (i.e., concepts) from the abstracts of the publication sample, to characterize the topics of research streams. Smith and Humphreys (2006) provide a detailed description of Leximancer functionalities and calculation logic. The algorithm-based identification of key ideas in discourses supports the current endeavor to provide an objective literature review based on quantitative analysis techniques.

In informetric studies, social network analysis is commonly performed on co-citation data of the reference sample to reveal linkages and hidden structures on publication and discourse levels (Otte & Rousseau, 2002). In addition to visualization, social network analysis provides numerical indicators to substantiate the characterization of networks (Barnett, Huh, Kim, & Park, 2011). We use the software UCINET to display network structures and to calculate density scores (Borgatti, Everett, & Freeman, 2002). The density indicator quantifies the degree to which information is exchanged within and between research streams. Density scores are calculated by dividing the number of existing ties by the number of all possible ties between discourses (Hanneman & Riddle, 2005). The more ties exist, the denser is the network and the more closely related are the discourses across the network (Biehl, Kim, & Wade, 2006).

3. Findings on research streams

We investigate the references and abstracts of the 1165 articles in the publication sample to obtain a detailed understanding of price promotion research streams. First, we conduct factor analysis on co-citation data to identify distinct research streams and their representative publications. Second, we describe each stream's main topics on the basis of key concepts provided in the abstracts. Finally, we join both analysis results to interpret and characterize the revealed discourses.