

Cross-Channel Effects of Price Promotions: An Empirical Analysis of the Multi-Channel Grocery Retail Sector

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Available online 26 February 2016

Abstract

An important consideration for multi-channel grocery retailers is which promotion strategy to adopt across channels. The tendency of grocery buyers to keep visiting the offline store after they start to buy at the chain's online store implies that promotions in one channel can have substantial negative effects on buying behavior in the other channel, especially if the promotions differ across channels. This article examines the cross-channel effects of price promotions on category purchase decisions, taking into account both contemporaneous effects (during the promotion period) and cross-period effects (after the promotion period). For cross-period promotion effects, a distinction is made between lagged promotion effects on subsequent category purchases, and promotion frequency effects on future promotion effectiveness. The results show that (1) promotions in one channel can have negative effects on category purchases in the other channel during the promotion period, (2) these cross-channel effects are asymmetric, (3) high promotion frequency can have negative effects on future promotion effectiveness in the other channel, and (4) cross-channel effects are more negative for more loyal customers of the chain.

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Keywords: Multi-channel grocery shopping; Price promotions; Cross-channel promotion effects; Promotion effectiveness

“The future of grocery shopping is multi-channel.”

—Joanne Denney-Finch, chief executive (IGD 2009)

Online grocery sales are expected to rise from 3.3 percent of total U.S. grocery spending to 11 percent by 2023 (Steiman 2014), and are expected to double its value in the U.K. by 2020 to £17.2 bn (IGD 2015). Most online grocery shoppers regularly visit both online and offline grocery stores, most often using the online and offline channel of the same (primary) chain (Melis et al. 2015). These multi-channel shoppers constitute a rapidly growing segment that dramatically changes the grocery market (IGD 2011). As an interesting and consequential aspect of this change in market conditions, multi-channel shoppers are exposed to marketing actions of a chain's online and offline channel.

The trend of grocery shoppers using multiple channels rather than migrating to an online channel (as is more likely in

non-grocery categories; Ansari, Mela, and Neslin 2008) therefore challenges grocery retailers to construct operations models more strategically and implement marketing mix strategies carefully (Retail Systems Research 2013). In this research, the focus is on promotional strategies, and more particularly on the cross-channel promotion effects they entail. When implementing different promotional actions across channels, multi-channel retailers must wary about whether and how promotions in one channel influence buying behavior of their customers in the other channel. Customers of a multi-channel grocery chain can take advantage of special offers available in the chain's online and offline channel. This may lead to subsidization of loyal chain customers rather than enhancing store traffic and overall sales. A survey conducted by IGD (2011) indeed confirms that a more extensive promotion offer is an important motivation for many shoppers to visit multiple channels.

The decision whether and how to differentiate promotions across channels is therefore an important managerial issue. Previous research, however, provided only partial insights into promotion effects in a multi-channel context. In this research, we aim to provide a comprehensive analysis and examine the effect of price promotions on household category purchase

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decisions (i.e. category purchase incidence and quantity decisions) in a multi-channel grocery retail context, where consumers visit the offline and online channel of the same chain. We take into account both within and cross-channel promotion effects (i.e. effects on the own and other channel), as well as contemporaneous and cross-period promotion effects (i.e. effects during and after the promotion period). For cross-period promotion effects, we distinguish between short term lagged promotion effects on subsequent category purchases, and longer term promotion frequency effects on future promotion effectiveness. Focusing on cross-channel and cross-period promotion effects is particularly relevant for repeatedly purchased categories like groceries, where multi-channel shoppers regularly visit (and are thus exposed to promotions in) online and offline channels. The estimation results shed light on several important research questions: whether and how promotions in one channel reinforce category sales in the own channel, cannibalize category sales in the other channel, lead to lower category sales in post-promotion periods, and/or reduce promotion effectiveness by making consumers less responsive to promotions. Based on the estimation results, we use simulations to detail different payoffs, in the form of sales revenue earned from different promotion strategies.

Our unique data set for this study consists of a representative U.K. household panel from Kantar Worldpanel, obtained from AiMark. The data cover online and offline household grocery purchases at Tesco, for a 78-week period. We estimate category purchase decision models (incidence and quantity) for two frequently purchased categories, milk and cereals, across Tesco's online and offline stores. Tesco is the U.K. market leader in the grocery sector in the offline as well as the online channel.

From an academic point of view, this study provides important contributions to promotion and multi-channel retailing literature. To the best of our knowledge, this is the first study to examine explicitly the effects of promotions in one channel on buying behavior in the other channel of the same chain. We also extend promotion literature by providing a comprehensive analysis of own- and cross-channel promotion effects, taking both contemporaneous and cross-period promotion effects into account. That is, most previous literature focuses on cross-competitive promotion effects on brand or store choice within an offline channel (Ailawadi and Neslin 1998; Bell, Chiang, and Padmanabhan 1999; Blattberg, Briesch, and Fox 1995; Bucklin and Gupta 1992). Studies that examine promotion effects in different channels mainly note differences in promotion effectiveness between channels, without examining whether promotions in one channel also affect purchase decisions in the chain's other channel (Chu, Chintagunta, and Cebollada 2008; Zhang and Wedel 2009). By using estimation results to simulate the effect of different promotion scenarios, we provide interesting insights into the sales revenue effects of different promotion strategies. Such an approach may help multi-channel retailers improve their overall business strategy and optimize cross-channel synergies through more effective promotion planning.

In the next section, we present a brief overview of promotion effects examined in an offline context, and indicate how these findings can be translated to expected promotion effects

in a multi-channel grocery shopping context. Next, we describe our modeling approach and the data we used for the empirical analysis. After an overview and discussion of the estimation and simulation results, we discuss our main findings and the resulting managerial implications. We end with limitations and extensions for future research.

Price Promotion Effects in a Multi-Channel Context

Price promotions, and the different effects they may have on offline consumer buying behavior, have been examined in several previous studies (for a review, see van Heerde and Neslin 2008). We seek to analyze these effects in a multi-channel shopping environment, from the retailer's perspective. For this reason, we focus on category-level (purchase incidence and quantity) effects, rather than brand-level (choice/switching) promotion effects (Ailawadi et al. 2007; Bell, Chiang, and Padmanabhan 1999; van Heerde and Neslin 2008).³ As indicated in Table 1, we provide a comprehensive analysis, by distinguishing between own- and cross-channel promotion effects (i.e. effects in the same channel or in the other channel, respectively), and between contemporaneous and cross-period promotion effects (i.e. effects during or after the promotion period, respectively). For cross-period promotion effects, we further differentiate between lagged promotion effects (i.e. effects on category purchase decisions in the post-promotion period, resulting from consumers' stockpiling behavior; Ailawadi et al. 2007; van Heerde and Neslin 2008) and promotion frequency effects (i.e. changes in promotion effectiveness due to [high] promotion frequency in the past; Foekens, Leeflang, and Wittink 1999; Kopalle, Mela, and Marsh 1999).

Own-Channel Promotion Effects

Own-channel promotion effects (contemporaneous, cross-period lagged and cross-period promotion frequency effects) have been examined in multiple past papers, and in most cases provided consistent results (Bucklin and Gupta 1992; Degeratu, Rangaswamy, and Wu 2000; Foekens, Leeflang, and Wittink 1999; Kopalle, Mela, and Marsh 1999; van Heerde and Neslin 2008; Zhang and Wedel 2009). Based on these results and the underlying mechanisms discussed in previous studies, we formulate the following hypotheses. First, given the findings that online and offline promotions can induce consumers to buy a category earlier than planned or in larger quantities, at the expense of either competitive chains (category growth at the chain level; van Heerde and Neslin 2008) or future purchases (loyal acceleration in the own channel; Ailawadi et al. 2007), we expect a strong, positive contemporaneous effect of price promotions on consumers' category purchase decisions (H1). Second,

³ In the following discussions, we do not distinguish explicitly between category purchase incidence and quantity, because previous research has demonstrated that promotions have effects of similar direction on both decisions (Bell and Hilber 2006). We do, however, allow the magnitude of effects to differ (see the Model section).

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