



The Impact of Cross-Channel Integration on Retailers' Sales Growth

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Abstract

The authors propose a conceptual framework to explain whether and under what firm-level conditions cross-channel integration impacts firm sales growth. To test the theory, the authors conduct a qualitative grounded-theory study to build a measurement tool for cross-channel integration at four levels and analyze longitudinal data on 71 publicly traded U.S. retail firms from 2008 to 2011, gathered from multiple secondary sources. The findings reveal that cross-channel integration stimulates sales growth, but that firm online experience and physical-store presence weaken this effect.

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Introduction

Added channels create new opportunities but also various complexities for retailers that must leverage their multiple channels appropriately to avoid channel cannibalization and achieve synergies (Verhoef 2012). Zhang et al. (2010) and Verhoef (2012) suggest that cannibalization or synergy depends on retailers' channel combination ability. Accordingly, cross-channel integration, which involves decisions about how to combine channels to create cross-channel synergies, is a pertinent topic for multichannel retailing (Avery et al. 2012; Berry et al. 2010; Verhoef 2012; Verhoef, Neslin, and Vroomen 2007; Zhang et al. 2010).

Whereas substantial attention focuses on the effects of the addition or elimination of channels on firm performance (Cheng et al. 2007; Deleersnyder et al. 2002; Geyskens, Gielens, and Dekimpe 2002; Homburg, Vollmayr, and Hahn 2014; Konuş, Neslin, and Verhoef 2014; Kumar and Venkatesan 2005; Xia and Zhang 2010), research provides little empirical evidence about the effect of integration across channels on firm

performance when retailers add new channels (Avery et al. 2012). In the quickly emerging literature on cross-channel integration, various studies offer conceptual frameworks (Berry et al. 2010; Neslin et al. 2006; Stone, Hobbs, and Khaleeli 2002; Verhoef 2012; Zhang et al. 2010), analytical modeling (Berger, Lee, and Weinberg 2006; Neslin and Shankar 2009; Ofek, Katona, and Sarvary 2011; Yan, Wang, and Zhou 2010; Zettelmeyer 2000), exploratory research using a qualitative approach (Steinfeld, Bouwman, and Adelaar 2002), or empirical evidence based on consumer surveys (Bendoly et al. 2005; Montoya-Weiss, Voss, and Grewal 2003; Van Baal 2014; Verhoef, Neslin, and Vroomen 2007). The summary in Table 1 reflects the current state of empirical evidence about firm performance related to cross-channel integration. The findings involving performance outcomes are based on relatively limited measures (i.e., coordinated price or assortment) of cross-channel integration (Ancarani and Shankar 2004; Avery et al. 2012; Pan, Ratchford, and Shankar 2002; Tang and Xing 2001; Xing, Yang, and Tang 2006). Furthermore, these studies offer few theoretical explanations of the effects of cross-channel integration. To the best of our knowledge, only one study (Oh, Teo, and Sambamurthy 2012) relies on broader dimensions to capture the capabilities of IT-enabled retail channel integration and cross-channel human resource management, but it uses perceived measures to assess firm performance. Although Oh, Teo, and Sambamurthy (2012) explore the resource-based view (RBV)

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Table 1
Empirical studies of the firm performance outcomes of cross-channel integration.

Author	Marketing	Research approach	Data	Cross-channel integration measure	Moderator	Outcome	Performance measure
Avery et al. (2012)	Yes	Quasi-experimental	Four retail stores in one U.S. state for a multichannel retailer	Same merchandize; same price		Short-term: sales in the catalog (–) and online (+); long-term: sales in the catalog (+) and online (+)	Factual
Tang and Xing (2001)	Yes	Parametric and nonparametric statistical tests	4,896 price observations related to six multichannel retailers and six pure players in the U.S.	Coordinated price		Margin (+)	Factual
Ancarani and Shankar (2004)	Yes	Three-way tests of differences	8,085 price quotes related to four pure players, two multichannel, and five traditional retailers in Italy	Coordinated price		Margin (+); differentiation at price (+)	Factual
Pan et al. (2002)	Yes	Factor analysis and hedonic price regression	6,739 price quotes related to 105 retailers	Coordinated price; coordinated customer service		Margin (+)	Factual
Xing et al. (2006)	Yes	Feasible generalized least squares estimates	15,708 price observations related to six pure players and five multichannel retailers in the U.S.	Coordinated price		Margin (+); differentiation at price over time (–)	Factual
Oh et al. (2012)	No	Firm survey and partial least squares model	125 multichannel retailers in Singapore	IT-enabled retail channel integration capability; cross-channel human resource capability	Environmental dynamism	Firm performance (+)	Perceived
Current study	Yes	Grounded theory and panel regression	71 multichannel retailers in U.S. from 2008 to 2011	27 factors capturing cross-channel retailers' front office and back office activities and organizational structure	Firm-level factors: firm online experience and physical store presence	Sales growth (+)	Factual

and organizational learning perspectives, they do not link them closely to a retailing context; their study examines contingent factors of the effect of cross-channel integration but introduces only one industry-level factor (environmental dynamism).

In response, the current study seeks to address two neglected questions: (1) Does cross-channel integration contribute to firm sales growth, and (2) which firm-level factors increase or decrease the effects of cross-channel integration on sales

growth? We focus on sales growth to evaluate the effectiveness of cross-channel integration for two reasons: Not only is sales growth a preferred way to measure channel performance in existing literature (Geyskens, Gielens, and Dekimpe 2002) but also, as Table 1 shows, few studies provide empirical evidence about the impact of cross-channel integration on sales growth, despite the compelling economic argument for retailers to coordinate their activities across channels to increase sales (Neslin and Shankar 2009).

By addressing these research questions, this study makes several contributions to multichannel retailing literature. First, it offers a comprehensive conceptual framework of the effects of cross-channel integration on firm sales growth. In this framework, we identify four positive mechanisms and one negative mechanism, then reveal how these mechanisms are strengthened or weakened by firm-level factors. Second, this study advances understanding of cross-channel integration. Extending the work of Zhang et al. (2010) and Chaffey (2010) on the stage-of-adoption perspective, we classify cross-channel integration into four evolutionary stages and identify key indicators for each stage with a qualitative, grounded theory study. Third, our findings extend the literature on channel additions. We integrate multiple secondary sources of longitudinal data about 71 publicly traded U.S. retail firms between 2008 and 2011 (271 firm-year observations) to test our theoretical model. The empirical results confirm the positive influence of cross-channel integration on firm sales growth and reveal how this effect is moderated by firm online experience and physical store presence.

Conceptual Foundations

Definition of Cross-Channel Integration

As interest in the topic has grown (Avery et al. 2012; Berry et al. 2010; Verhoef 2012; Verhoef, Neslin, and Vroomen 2007; Zhang et al. 2010), several efforts have sought to clarify what “cross-channel integration” represents. Despite a lack of a standard definition (Marianne 2013), prior literature identifies several fundamental elements. Specifically, cross-channel integration is a way to use or employ multiple channels or media, such that various definitions refer to it as the “use of more than one channel or medium” (Stone, Hobbs, and Khaleeli 2002, p. 40), “the use of multiple modes of fulfillment” (Bendoly et al. 2005, p. 314), “employment of Web sites and physical storefronts possibly in addition to other channels” (Goersch 2002, p. 749), and “utilizing the full range of commercially viable channels” (Payne and Frow 2004, p. 531).

In terms of how a firm should use its multiple channels, two main approaches appear in the prior literature: narrow or broad. Narrow definitions highlight the simultaneous and consistent employment of multiple channels (Goersch 2002), including even homogenized offerings across all channels (Vanheems 2009). In this case, the distribution activities across channels come under the management of a single entity (Coelho and Easingwood 2003), which builds a holistic, total system (Schramm-Klein and Morschett 2006; Vanheems 2009). In

contrast, broad definitions suggest varied uses of multiple channels that are not necessarily consistent (Stone, Hobbs, and Khaleeli 2002), synchronized, or complementary (Berger et al. 2002). The different uses constitute one means of “coordination” across channels (Neslin et al. 2006; Steinfield, Bouwman, and Adelaar 2002; Stone, Hobbs, and Khaleeli 2002). Plé (2006, p. 330) offers a definition of coordination in this context as “the management of interdependencies between activities across channel,” so the focus of the coordination might be the objectives, design, or deployment of channels (Neslin et al. 2006). For broad views, cross-channel integration is a process to develop, defined as “the extent to which online and traditional channels interact with each other and cooperate with advertising and promotion” (Yan, Wang, and Zhou 2010, p. 434) or “the degree to which the firm distributes its products and contacts to its customers through channels and communication vehicles that are synchronized and complementary” (Berger et al. 2002, p. 46). The degree of coordination can range from a complete separation of channels to full coordination (Neslin et al. 2006). In addition, a broad definition acknowledges the stages associated with developing cross-channel integration. This approach creates opportunities for firms, while also enabling researchers to measure the construct by observing the firm’s activities in managing interdependencies between its channels.

The definition of cross-channel integration also indicates two other perspectives: customer- vs. firm-centric. Customer-centric perspectives assert that the concept is highly customer-oriented (Schramm-Klein and Morschett 2006), namely as a way to manage customers (Stone, Hobbs, and Khaleeli 2002), shift consumers from channel A to B (Montoya-Weiss, Voss, and Grewal 2003), and offer particular benefits to customers (Gulati and Garino 2000), such as enhanced satisfaction (Montoya-Weiss, Voss, and Grewal 2003) achieved through seamless shopping experiences (Goersch 2002; King, Sen, and Xia 2004). Firm-centric perspectives instead focus on the benefits for the firm, such as creating cross-channel synergies (Neslin et al. 2006), achieving economies of scale (Chaffey 2010; Neslin et al. 2006), and improving profitability (Steinfield, Bouwman, and Adelaar 2002). Neither perspective can fully reveal the firm’s expectation of its multichannel retailing strategies alone (Neslin and Shankar 2009; Verhoef 2012). Therefore, we approach the concept from both perspectives.

Combining these discussions, we propose a comprehensive definition of cross-channel integration, as follows:

Cross-channel integration is the degree to which a firm coordinates the objectives, design, and deployment of its channels to create synergies for the firm and offer particular benefits to its consumers.

Cross-Channel Integration and Firm Sales Growth

From the existing literature, we identify five mechanisms by which cross-channel integration affects firm sales growth: (1) improved trust, (2) increased customer loyalty, (3) higher consumer conversion rates, (4) greater opportunities to cross-sell, and (5) the loss of special channel features. The first four

mechanisms suggest positive impacts of cross-channel integration on sales growth; the latter indicates a negative effect.

Improved trust. By using combinations of channels, retailers can explore the benefits and overcome the deficiencies of each channel to create an appealing and safe shopping experience for consumers (Zhang et al. 2010). First, cross-channel integration enables consumers to gather as much information as they desire in a convenient way, such that it effectively reduces information asymmetry, as perceived by consumers. For example, consumers can compare prices and access broad assortments through a retailer's website, then use "click-to-call" services to get more interactive advice from its call center. Second, coordinated marketing programs reduce consumers' confusion. Integrated branding and communication, and similar merchandize and price structures, across channels ease consumers' uncertainty and enhance their trust in the retailer (Davis, Buchanan-Oliver, and Brodie 2000; Schramm-Klein and Morschett 2006). Third, cross-channel integration provides customers with the freedom to use different channels in different situations (e.g., purchasing stages and product categories) (Berry et al. 2010). Therefore, it reinforces their sense of self-control and engenders a feeling of safety (Goersch 2002). For example, consumers use websites to search for goods, because this channel is convenient and flexible, then visit a physical store to purchase, because they want to touch the product and conduct a private transaction (Neslin and Shankar 2009).

Increased consumer loyalty. Cross-channel integration might increase consumer loyalty through two mechanisms. A combination of channels enables retailers to provide value-added services to consumers (Sousa and Voss 2006; Stone, Hobbs, and Khaleeli 2002), which improves their perceptions, attitudes (Schramm-Klein and Morschett 2006), satisfaction (Berry et al. 2010; Montoya-Weiss, Voss, and Grewal 2003; Van Birgelen, De Jong, and De Ruyter 2006), and loyalty (Neslin and Shankar 2009). Consumers reward the retailer by purchasing more and concentrating their purchases with it (Avery et al. 2012; Payne and Frow 2004; Pentina and Hasty 2009; Stone, Hobbs, and Khaleeli 2002; Van Baal and Dach 2005). In addition, cross-channel integration encourages customer relationships with the brand, by providing value-added service and customization (Calder and Malthouse 2005; Neslin et al. 2006). With data integration across channels, retailers can create clear pictures of consumer behavior, buying patterns, and trends. Leveraging these insights, the retailer can identify, understand, and respond to its best consumers (Stone, Hobbs, and Khaleeli 2002), thus increasing the possibility of profitable, long-term relationships with them.

Higher consumer conversion rates. In terms of boosting the consumer conversion rate (Neslin et al. 2006), consumers can easily be convinced in a cross-channel shopping environment that they have made the right decision at the crucial moment they consider a purchase. By searching on the Internet before visiting a store, the customer can discover which product attributes to trade off and thus more readily select the right product when in the store (Neslin et al. 2006). The implementation of cross-channel integration also helps retailers lock in customers to certain channels (Verhoef, Neslin, and Vroomen

2007); it is much easier for a customer to leave a website than to walk out of a store while being waited on by store personnel (Neslin and Shankar 2009). The combination of channels encourages online customers to shop in stores (Bendoly et al. 2005; Montoya-Weiss, Voss, and Grewal 2003). New technology offers retailers opportunities to bring together Internet, mobile, and offline channels into seamless customer experiences. In-store consumers thus may benefit from online and offline advantages: They can see, touch, and feel products before buying, while also easily accessing vast product information and sharing their shopping experiences with others in their social networks, options previously available only to online shoppers. Increased convenience, improved experiences, and a strong sales force presence all reduce customer churn rates and push them to purchase from the firm (Stone, Hobbs, and Khaleeli 2002).

Greater opportunities to cross-sell. Cross-channel integration helps retailers introduce consumers who visit one channel to other channels, which builds loyalty and cross-buying (Berry et al. 2010; Neslin et al. 2006). For example, by encouraging consumers to browse product availability in their local stores, retailers direct them from the website to store. Once in the store, consumers have lower service demands and can be exposed to cross-selling (Neslin et al. 2006). The combination of channels also enables firms to maintain contact with consumers, which increases cross-selling opportunities (Berry et al. 2010; Neslin et al. 2006). For example, retailers might use direct mail, catalogs, and websites to strengthen their relationships with customers (Zhang et al. 2010), then funnel them into stores (Gulati and Garino 2000). Opportunities to cross-sell also result from cross-promotions, in that marketing efforts in one channel may enhance sales through another (Berry et al. 2010). As Pauwels and Neslin (2008) show, catalogs enhance sales through the catalog channel but also through online and store channels, in both the short and the long term. Finally, channel integration increased customer data sharing across channels, leading to a more complete customer profile that maximizes cross-selling opportunities (Payne and Frow 2004; Stone, Hobbs, and Khaleeli 2002).

Loss of special channel features. Retail channels differ in their features, which create unique customer experiences (Berry et al. 2010). A consumer's retail experience depends on the store/website atmosphere, social environment, service interface, product assortment, and prices (Verhoef et al. 2009). Coordinated marketing programs across channels might reduce retailers' strategic flexibility and slow their adjustments in the marketplace (Neslin et al. 2006). In particular, channel integration limits retailers' ability to satisfy the special expectations of consumers in a particular channel and to differentiate themselves from major competitors (Berry et al. 2010). In this sense, greater integration across channels even may lead to decreased total sales, if long-standing consumers who are especially attached to a particular channel no longer find the expected features and advantages there, and therefore switch to competitors. The services provided by retailers through different channels remain qualitatively distinct (Berry et al. 2010), and consumers clearly perceive and even expect such differences (Verhoef, Neslin, and Vroomen 2007). For example, some consumers want social

contact and information support from in-store employees; new self-service technologies adopted in accordance with cross-channel strategies (e.g., obtaining product information with a mobile app or kiosks) may result in an unsatisfactory shopping experience for these consumers, who find that such technologies reduce their direct contact with store employees and weaken their social bonds with the retailer, ultimately eroding their loyalty toward that retail brand (Selnes and Hansen 2001).

Because these varied mechanisms have effects in both directions, retailers need to consider the overall net effect of cross-channel integration on firm sales growth, in distinct contexts. We summarize our predictions in Table 2, using a plus sign to indicate that a particular contextual factor should strengthen the mechanism, a minus sign to show that a factor weakens it, a plus/minus sign to indicate that good arguments exist for both positive and negative links, and a blank space to note that we do not expect strong impacts in either direction.

Hypotheses

Effects of Cross-Channel Integration on Firm Sales Growth

The mechanisms discussed as underlying the effect of cross-channel integration on sales growth mainly suggest a positive effect; some recent developments in the multichannel retailing landscape will further strengthen this effect. First, the rapid development of interactive technologies has changed how consumers interact with retailers' multiple channels (Berry et al. 2010). Most customers engage in a buying cycle that crosses channels: They research a product online, visit the store to investigate, then purchase in the store, online, or through the call center, for example. Altered shopping behaviors influence their expectations of different retail channels. According to an IBM (2011) survey, consumers seek a seamless experience across channels rather than special features in any given channel. As retailers respond to this expectation and integrate multiple channels, the retail landscape continues to change. If an integrated multichannel system becomes the standard, consumers should learn to expect fewer special features from one channel and seek more consistent experiences across channels.

Second, new technologies enable channels to provide features that previously were restricted to other channels and thereby reduce service differences across channels. For example, Nordstrom.com uses Shoefitr's 3D-imaging software to provide online shoppers with size and fit recommendations, similar to those they could receive from in-store employees. In stores and elsewhere, mobile apps give consumers easy access to peer or expert reviews and user-generated content, whereas previously only online channels provided such features (Dwyer 2007).

Third, retailers' increasing data integration and big data analysis abilities improve their understanding of consumers' cross-channel shopping behavior, helping them observe, measure, and leverage how the synergies across their channels influence consumer behavior (Berry et al. 2010). Consumer-level tracking allows retailers to provide each consumer with tailored services to satisfy the individual's unique expectations of different channels and thus reduce the negative effects of

cross-channel integration (Selnes and Hansen 2001). For example, a personalized RFID-enabled shopping card helps store staff identify consumers' profiles, so that they can provide efficient, appropriate mixes of personal and self-service at the right moment. These three trends all suggest positive mechanisms, so we hypothesize:

H1. Cross-channel integration has a positive effect on firm sales growth.

Moderating Factors

Zeithaml, Varadarajan, and Zeithaml (1988) propose reasonably broad categories of moderating variables (i.e., environmental, industry structure, competitor, supplier, consumer behavior, and firm-level) that likely influence the effectiveness of business strategies; our hypotheses focus on firm-level factors, for two reasons. First, exploring which types of multichannel retailers are more likely to benefit from cross-channel integration can deepen our knowledge of multichannel retailing (Zhang et al. 2010). Second, despite their theoretical and practical importance, the moderating effects of firm-level factors have been largely neglected in empirical studies (Table 1). As we show in Fig. 1, we predict that the relationship between cross-channel integration and firm sales growth is contingent on two main firm resources: online experience and physical store presence (Srinivasan and Moorman 2005).

Firm online experience. The level of firm online experience reflects the number of years the firm has operated its online sales (Oh, Teo, and Sambamurthy 2012). A firm with more online experience has more digital experience (Chaffey 2010). Zhang et al. (2010) highlight the importance of digitization for firms to create cross-channel synergies. Therefore, firms with more online experience should achieve better capitalization from their cross-channel integration. However, a fine-grained analysis of the five main mechanisms in contexts marked by high or low firm online experience suggests that previous studies find a negative moderating effect of online experience on the influence of cross-channel integration on firm sales growth. In Table 2, four mechanisms are affected: improved trust, higher conversion rate, greater opportunities to cross-sell, and loss of special channel features. If a firm has more online experience, it initiated its online sales a long time ago and probably has established online brand awareness. Consumers thus should perceive a low purchase risk online (Srinivasan and Moorman 2005) and also purchase offline from such firms (Gabisch and Gwebu 2011). The firm's greater online experience should decrease the probability that cross-channel integration significantly improves consumers' trust.

Furthermore, a firm with more online experience likely loses opportunities to direct online consumers into physical stores. According to the RBV (Barney 1991) and dynamic capabilities perspectives (Teece, Pisano, and Shuen 1997), online experience implies a firm's capabilities in online customer acquisition, conversion, and retention. Bialogorsky and Naik (2003) suggest that online equity, which depends on the firm's online experience, increases the effectiveness with which it converts online

Table 2
 Effects of moderators on mechanisms influencing cross-channel strategy effectiveness.

Moderators	Positive mechanisms				Negative mechanisms	Hypothesized net effect
	Improved trust	Increased consumer loyalty	Boosted conversion rate	Greater opportunities to cross-sell	Loss of special channel features	
Firm online experience	–		–	–	+	– H2
Physical store presence	–		+/-	+/-		– H3

Notes: Positive (negative) signs represent moderating conditions that strengthen (weaken) the effects of positive and negative mechanisms on firm sales growth. For example, “+” indicates that firm online experience increases the negative impact of loss of special features on firm sales growth, and “–” implies that firm online experience decreases the positive impact of improved trust on firm sales growth.

visits into online purchases. Therefore, consumers seeking information on the online channel of a retailer with more online experience should be convinced more easily to buy through the web channel instead of visiting its physical store. The online environment also helps them save time and energy, and gain convenience benefits (Meuter et al. 2000). According to status quo bias theory (Kahneman, Knetsch, and Thaler 1991), people prefer to stay with their current channel, irrespective of the utility of alternative channels (Falk et al. 2007). Therefore, online consumers of a retailer with more online experience should be reluctant to shift to other channels, such as the physical store, even if it might offer utilities, such as touching products or picking up orders immediately without shipping charges. Retailers with more online experience lose such opportunities to cross-sell (Ansari, Mela, and Neslin 2008), and they also should benefit less from higher conversion rates due to cross-channel consumer behavior.

If a firm operates an online business over time, its existing online consumers have become accustomed to shopping in a certain environment and are attached to the features it offers. Any changes or efforts to move consumers from one channel to another create the risk of disappointing these customers (Neslin and Shankar 2009), such that they may become frustrated or withdraw their trust. Such a company likely loses consumers—in effect, handing them to competitors (Payne and Frow 2004). The negative mechanism strengthens the effect of cross-channel strategies on firm performance for firms with more online experience. We hypothesize:

H2. Firm online experience negatively moderates the effect of cross-channel integration on firm sales growth.

Physical store presence. The firm’s physical store presence refers to the number of physical stores it operates (Oh, Teo, and Sambamurthy 2012). On the basis of previous studies (Table 2), we expect changes in the form of improved trust, higher conversion rate, and greater opportunities to cross-sell mechanisms if the retailer has a larger, rather than smaller, physical store presence. In particular, a larger physical store presence increases consumers’ exposure to the retailer’s brand. Repeated exposures should strengthen brand awareness and deepen brand associations (Avery et al. 2012), which in turn may transfer to the retailer’s other channels (Jacoby and Mazursky 1984; Keller 1993). Positive associations formed through the knowledge or patronage of the store can transfer to other channels as a halo effect (Kwon and Lennon 2009). A large physical store presence already should have contributed to improving consumer trust in other channels and increased sales through them over time (Avery et al. 2012), even if the retailer does not integrate multiple channels. Therefore, a retailer with a larger physical store presence has less to gain from cross-channel integration through improved trust.

For the conversion rate and opportunities to cross-sell, cross-channel integration enables retailers to direct consumers from online to offline (Bendoly et al. 2005; Montoya-Weiss, Voss, and Grewal 2003). A firm with a larger network of physical stores can better leverage its presence in multiple local markets

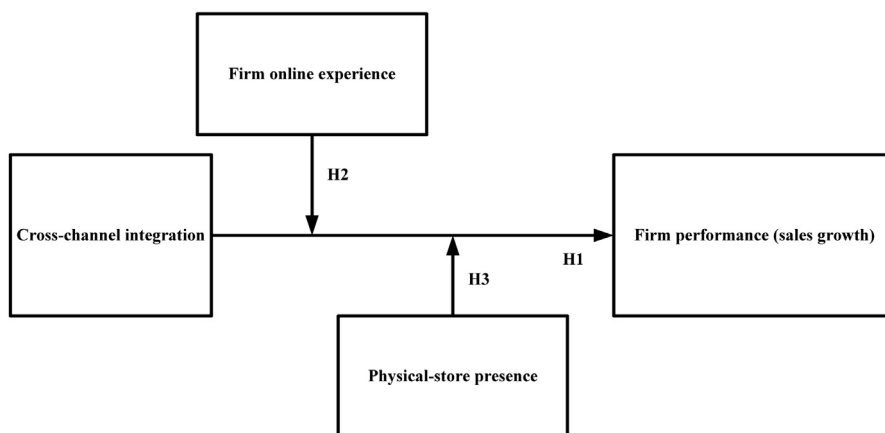


Fig. 1. Theoretical model.

(Oh, Teo, and Sambamurthy 2012; Steinfield, Adelaar, and Liu 2005) and more easily direct online consumers to visit stores. Such retailers may have a greater chance of boosting the conversion rate and benefiting from cross-selling opportunities through cross-channel integration. For example, consumers should perceive convenience if a retailer with an intensive store network offers a click-and-pick-up service. However, the larger physical store presence has likely already increased consumers' in-store visits, irrespective of channel integration. In terms of multi-channel consumer behavior, consumers' channel choices for their search or purchase stages depend on the benefits and costs they derive from searching on or purchasing from the multiple channels (Balasubramanian, Raghunathan, and Mahajan 2005; Konus, Verhoef, and Neslin 2008). A larger physical store presence drives them to search and purchase, or at least purchase, in-store, because of the increased convenience, combined with the other benefits traditionally provided by physical stores. In line with categorization theory (Alba and Hutchinson 1987), Benedicktus et al. (2010) also suggest that consumers categorize hybrid retailers as traditional rather than e-tailers. This inclination might be stronger for a retailer with a larger physical store presence, which leads consumers to expect traditional retailer characteristics, such as human contact and the ability to inspect products before purchase (Benedicktus et al. 2010). For these consumers, visiting the physical store seems indispensable in both the search and purchase phases of their shopping process, even in a multichannel setting. Therefore, the contribution of cross-channel integration to the sales growth of retailers with a larger physical store presence should be less significant due to increases in the conversion rate and opportunities to cross-sell.

In conclusion, the previous argument seems mainly to suggest a negative effect. We therefore hypothesize the following:

H3. Larger physical store presence negatively moderates the effect of cross-channel integration on firm sales growth.

To examine these hypotheses, we conducted both qualitative and quantitative studies. For the qualitative study, we adopted the grounded theory method (Corbin and Strauss 2008) to build measures of cross-channel integration that are practicable and reflective of retail practices. In the quantitative study, we used the results of our qualitative study as a basis for measuring cross-channel integration, then measured the other variables and tested our theoretical model.

Qualitative Study

Previous studies acknowledge that most retailers develop their cross-channel integration gradually (Zhang et al. 2010), such that the degree of integration ranges from the complete separation of channels to full coordination (Neslin et al. 2006). However, measures of cross-channel integration from this evolutionary perspective have not been operationalized. Furthermore, there are two main limits to the existing measurement tools. First, they rely on limited dimensions to assess multichannel integration (Oh, Teo, and Sambamurthy 2012; Schramm-Klein and Morschett 2006). However, retailers' strategic shifts toward cross-channel strategies requires them to change nearly all

aspects of their business, including both front-end and back-end operations (Sousa and Voss 2006) and their organizational structure (Zhang et al. 2010). Second, existing measurement tools aggregate various dimensions to reflect the degree of integration, without considering the varying importance of different dimensions for determining the overall degree of integration (Pentina and Hasty 2009; Steinfield, Adelaar, and Liu 2005). Therefore, we conducted an exploratory, inductive study to build a more appropriate measurement tool. Our exploratory study relies on grounded theory (Corbin and Strauss 2008). We explore and highlight, by observing retailers' strategic activities and practices, (1) the evolutionary stages of cross-channel integration that retailers adopt and implement and (2) key indicators of each stage.

Research Setting

We chose U.S. retailers as the data pool, because they feature (1) rich diversity in their levels of cross-channel development, (2) substantial competitiveness, and (3) abundant publicly available information. We test the impact of cross-channel integration on the sales growth of U.S.-based retail firms over a four-year period, from 2008 to 2011. In this timeframe, U.S. retailers in general were moving quickly toward cross-channel integration (Aberdeen Group 2012).

The initial sample comprised 97 publicly traded retail companies on the New York Stock Exchange. Six companies were dropped due to insufficient available information, so the final sample consisted of 91 retail companies, covering seven retail sectors, according to the Industry Classification Benchmark: drug retailers (retail-sector code 5333), food retailers and wholesalers (5337), apparel retailers (5371), broadline retailers (5373), home-improvement retailers (5375), specialized consumer services (5377), and specialty retailers (5379).

Theoretical Sampling

We collected data from the annual reports (Securities and Exchange Commission [SEC] form 10-K) of a sample of U.S.-listed retailers selected from the final sample list of 91 firms, according to theoretical sampling criteria (Corbin and Strauss 2008). In total, we analyzed 32 firms, or 128 firm-years, after which point we reached initial data saturation (Corbin and Strauss 2008). The theoretical sample sought wide coverage of the phenomena and included a diverse range of multichannel strategies. The firms were selected specifically on the basis of the following criteria:

- Active in different sectors of retail activity (specialty, broadline, apparel, home improvement, specialized consumer services, food, and drugs).
- In each sector of activities, active in different product categories. For example, in the specialty retail sector, we studied Best Buy (electronic products), GameStop (video games), Family Dollar (general discount merchandize), and Dick's (sporting goods).

- Diversified in the size of their store networks and levels of online experience.

Data Analysis

Using information in their annual reports, we analyzed each firm's strategic activities and practices that related to multichannel activity or the integration of multichannel developments, using grounded theory content analysis. We conducted two sequential coding phases, using NVivo 9. First, we used an open coding procedure to identify preliminary concepts that fit with the data. For example, we assigned the label "Buy online and return in-store" to the statement "As with the catalog, customer online brand purchases can be returned by mail or at the individual brand's retail stores." The next unit of data was analyzed and compared with the first. If similar, it was assigned the same label; if not, it was coded with a different label. This process continued until we had identified 54 empirical codes. We discussed these codes with two experts in the field and retained 27 of them, removing those that were duplicates, ambiguous, or inappropriate. Second, we conducted axial coding to search for relationships among the subcategories, then assembled them into categories. We categorized the empirical codes by grouping them into subcategories, based on their underlying similarities. For example, the similar empirical codes "Align services across channels" and "Align assortment across channels" were grouped under the label "Aligning fundamentals." A general category (i.e., level of cross-channel integration) eventually emerged, according to each firm's choice of distribution channel policy and focus on specific activities at each level of integration for different purposes. For example, "Alignment of fundamentals," "Centralization of back-end system," and "Organization transformation" all shared the facet of control (retailers optimize established channels collaboratively by focusing on activities linked to consumers' seamless shopping experience) and thus were classified as subcategories of the main category "Multi-channel – full integration" (level 4).

Results

With this complex, systematic coding procedure, we aimed to capture various aspects of cross-channel integration and classify them into different evolutionary stages. Throughout the coding procedure, we strictly followed theoretical sampling and a constant comparative method to continue the data analysis until we reached data saturation (Corbin and Strauss 2008). This approach improved the reliability of the data interpretations. To enhance the validity of the research results and reduce the potential for bias, we also asked two experts to review a summary report of the framework and definitions. We reconducted the axial coding stage in accordance with their feedback, thus grouping the 27 empirical codes into four general categories and eight subcategories (Table 3), which informed our framework for measuring cross-channel integration. Then we applied this framework to analyze the remaining 59 firms (91 firms in the sample, less the 32 analyzed in the theoretical sample). No

new concepts emerged, which further validated the measurement tool, as we show in Table 3 (Corbin and Strauss 2008).

To ensure the content validity of our measure, we submitted the 27 items and the definitions of four categories of cross-channel integration to two experts in the areas of interactive marketing, retailing, and research methodology. We asked them to assign the individual items to what they believed to be the "correct" category of cross-channel integration. We then computed the reliability of the classification across different methods. We found 59 pairwise agreements, out of 81 possible, so the proportion of intercoder agreement was .73. Using Rust and Cooil's (1994) method to calculate the proportional reduction in loss (PRL), we included the number of categories, intercoder, and proportion of intercoder agreement, and derived a PRL reliability measure of .94. Rust and Cooil (1994) suggest using Nunnally's rule of thumb, so a PRL of .7 is adequate for exploratory work and .9 is adequate for advanced marketing research. We thus confirm the reliability of our measure of cross-channel integration.

Quantitative Study

Data

In the quantitative study, we tested the impact of cross-channel integration on the sales growth of U.S.-based, publicly traded retail firms over a four-year period (2008–2011). The sample comprised the 91 firms from our qualitative study. We dropped nine firms that (according to our qualitative study) applied a single-channel strategy for the entire four-year period. For the remaining 82 firms, we used the COMPUSTAT database to obtain accounting and financial information, supplemented by data about the number of physical stores, the date of first online sales from the S&P Capital IQ database, information from SEC 10-K reports (or annual reports), and details from other electronic databases (e.g., EBSCO, Factiva). Only firms with data available for all the variables in our study were included in the final sample. Overall, we obtained complete data on 71 firms, for a total of 271 firm-year observations. It is therefore an unbalanced panel sample because of some information missing on some firm-years.

Measures

Cross-channel integration ("Cross channel"). To measure the development of the cross-channel integration of the 71 firms in our final sample, we again analyzed the data from our qualitative study, to identify strategic cross-channel integration activities and the firm's level of integration in each year, according to its annual report. Unless otherwise specified, we assumed that all cross-channel strategic activities reported in previous years persisted in the year being studied, even if they were not mentioned again in the current annual report. The level of development of cross-channel strategies for each firm-year thus was measured as the highest level of strategic activity for the given year. For example, our qualitative study indicated that Walmart was involved in two strategic activities in 2009: "Presence in

Table 3
Measurement tool for cross-channel integration variables.

General category (cross-channel integration level)	Facet of control	Distinguishing subcategory	Empirical codes	Sample excerpts
Multichannel – silo mode (level 1)	Retailers sell goods or services through more than one channel but independently operate these channels	Presence in different channels	Presence in different channels (website, catalog, kiosks, mobile, social media, call center)	“We also provide our customers with online shopping at www.AdvanceAutoParts.com and access to over 100,000 parts and accessories. Our new website was launched in October 2009 and is operated by our dedicated e-commerce team.” (Advance Auto Parts Inc. annual report 2009)
		Different retail-mix policy	Different price policies in different channels	“... our online offerings to include greater assortments which include Best Buy Mobile offerings, online services scheduling, personalized shopping options and auction and outlet sites that offer more favorable pricing.” (Best Buy Co. Inc. annual report 2008)
			Different brands in different channels	“We are launching an e-commerce website at www.ps4u.com shortly thereafter. We plan to open approximately 10 P.S. from Aéropostale stores during fiscal 2009.” (Aéropostale Inc. annual report 2009)
			Different assortment policies in different channels	“The Company has buyers who specialize in customizing inventory for bookselling in stores and online. Store inventories are further customized by store managers, who may respond to local demand by purchasing a limited amount of fast-selling titles through a nationwide wholesaling network, including the Company’s distribution centers.” (Barnes & Noble Inc. annual report 2011)
Multichannel – minimal integration (level 2)	Retailers optimize established channels, collaboratively focusing on activities linked to marketing communication with consumers	Integrated marketing communication	Consistent use of the same brand in all channels Consistency of marketing message across channels	“Tiffany distributes a selection of its products in the U.S. and Canada through its websites at www.tiffany.com and www.tiffany.ca . Tiffany also distributes catalogs of selected merchandise to its proprietary list of customers in the U.S. and to mailing lists rented from third parties. SELECTIONS® catalogs are published four times per year, supplemented by other targeted catalogs. At the end of 2009, the Company had approximately 4.2 million names on its U.S. Internet and catalog mailing lists and in 2009 mailed approximately 12 million catalogs.” (Tiffany & Co. annual report 2010)
			Different service in different channels	“In February 2009, we launched an interactive, fully-integrated, virtual runway show on jcp.com featuring spring styles from our compelling selection of affordable exclusive designer brands, including nicole® by Nicole Miller, Bisou Bisou® by Michele Bohbot, ALLEN B.® by Allen B. Schwartz and I ‘Heart’ Ronson by Charlotte Ronson. The online experience gives our customers the opportunity to experience a dynamic runway show, complete with high energy music and 360 degree views of models in styles from each designer’s collection. The experience also includes video vignettes of our design partners sharing the inspiration behind their new collections along with their views on upcoming styles for spring.” (J.C. Penney Co. Inc. annual report 2009)
				“Further, through our website, store signage, and media presence, we are creating consumer awareness of the AutoNation brand.” (AutoNation Inc. annual report 2011) “We began an initiative to develop a strong brand presence and ensure consistency in the message we are sending to our customers, including delivering a consistent look and feel across our stores and ecommerce web sites.” (Christopher & Banks Corp. annual report 2011)

Table 3 (Continued)

General category (cross-channel integration level)	Facet of control	Distinguishing subcategory	Empirical codes	Sample excerpts
Multichannel – moderate integration (level 3)	Retailers optimize established channels collaboratively, focusing on activities linked to the transaction with consumers	Integration of consumer order fulfillment	Click and pick up in-store	“We also provide our customers’ online shopping and access to over two million stock keeping units, or SKUs. Our online site allows our customers to pick up merchandise at a conveniently located store or have their purchases delivered.” (Advance Auto Parts Inc. annual report 2009)
			Click-to-call	“Customers can also obtain real-time assistance from a contact center associate by using Click-to-Chat on Lowes.com.” (Lowe’s Cos. annual report 2011)
		Integration of consumer information access	Buy online and return in-store	“As with the catalog, customer online brand purchases can be returned by mail or at the individual brand’s retail stores.” (Talbots Inc. annual report 2008)
			Access to online inventory and online orders fulfilled by staff in-store	“Store-to-Door enables store associates to sell any item available online to an in-store customer in a single transaction. Customers are taking advantage of Store-to-Door by purchasing extended sizes that are not available in-store, as well as finding a certain size or color that happens to be out-of-stock at the time of their visit. The ordered items are shipped to the customer’s home free of charge.” (American Eagle Outfitters Inc. annual report 2011)
			Allowing online consumers to browse the inventory in-store	“Now, online customers can access merchandise no matter where it is located. If we are out of stock of an item at our fulfillment center, our systems instantly locate whether it is at any of our full-line stores and we can fulfill the online order at the store level.” (Nordstrom Inc. annual report 2010)
Multichannel – full integration (level 4)	Retailers optimize established channels collaboratively, focusing on activities linked to consumers’ seamless shopping experience	Alignment of fundamentals	Linkage between store and mobile app (WiFi in-store, locating store by mobile app)	“Late last year, we also put WiFi into all full-line stores. We did this to help our customers stay connected, make it easier for them to shop using their handheld device and set the stage for better mobile capabilities in our stores.” (Nordstrom Inc. annual report 2011)
			Aligned services across channels	“With our OfficeMax ImPress® Mobile application, customers can locate our stores and send a print document from their smart phones and other mobile devices.” (OfficeMax Inc. annual report 2011)
			Aligned promotion across channels	“Our interconnected retail initiative supports and connects our three other key initiatives. In fiscal year 2011, we focused on leveraging technology to improve our customers’ retail experience and provide better access to and information about our products. As described above, these efforts included information technology solutions that take tasks out of the store and free our associates to devote more time to customer-facing activities. They also included significant website enhancements and improvements to our special ordering process that allow customers to more easily find and purchase an expanded array of products and provide a choice in how to receive the order (for example, through our BOPIS program). Through our website, which can be accessed through computers, smart phones and other mobile devices, customers can not only purchase products, but can also connect with our associates and with one another to gain product and project knowledge.” (Home Depot Inc. annual report 2011)
			Aligned price across channels	“Based on customer feedback, the Company has taken several actions to improve the customer shopping experience across all channels, including more closely aligning in-store and online promotions and merchandise offerings to improve effectiveness while maintaining the capability to address unique customer needs in each channel.” (J.C. Penney Co. Inc. annual report 2008)
			Aligned loyalty program across channels	“The prices available on our website and from our call center are the same as the prices in the stores.” (Lumber Liquidators Holdings Inc. annual report 2008)
				“Sam’s Club Plus Members can now access their personalized eValuesSM through a kiosk in the club, the Sam’s Club smart phone application or online.” (Walmart Stores Inc. annual report 2011)

Table 3 (Continued)

General category (cross-channel integration level)	Facet of control	Distinguishing subcategory	Empirical codes	Sample excerpts
			Aligned assortment across channels	<i>“In connection with our multi-channel approach to reach consumers, we also operate FamousFootwear.com, Naturalizer.com, and Naturalizer.ca, which offer substantially the same product selection to consumers as sold in their respective retail stores.” (Brown Shoe Co. Inc. annual report 2010)</i>
		Centralization of back-end system	Integration of merchandize planning systems across channels	<i>“Our multi-channel model employs the same merchandising team, distribution centers, customer database, and infrastructure, which we intend to further leverage by building on the strengths of each channel.” (Cabela’s Inc. annual report 2011)</i>
			Integration of logistics across channels	<i>“Our online store’s merchandise is primarily shipped from our fulfillment center in Cedar Rapids, Iowa and we have the ability to fulfill online orders from any of our Nordstrom full-line stores.” (Nordstrom Inc. annual report 2011)</i>
			Integration of information systems across channels	<i>“In 2011 we implemented systems to share information across these channels. These included an upgrade to our store information technology infrastructure, better tools and greater access to information for our contact center employees, and equipping our on-site selling specialists with tools to help customers visualize a project, provide a real-time quote and tender a sale on site.” (Lowe’s Cos. annual report 2011)</i>
			Centralized call center service across channels	<i>“We operate a call center to support both DSW stores and dsw.com to address our customer service needs.” (DSW Inc. annual report 2009)</i>
			Integration of database of clients across channels	<i>“We leverage the database from our Stuff Fur Stuff club loyalty program of over four million active members in our direct mail and e-mail programs and provide information and ecommerce on our website, buildabear.com. In 2010, we continued to expand our use of social media to better reach our mom target audience. We have also begun utilizing affiliate marketing opportunities in other on-line spaces that share our values and target demographic.” (Build-A-Bear Workshop Inc. annual report 2011)</i>
		Organization transformation	Sharing knowledge across channels	<i>“The factors that drive shopping behavior – price, assortment, customer experience and trust – are as relevant for eCommerce today as they have always been for our various physical retail formats. What is changing is the technology that enables and shapes the retail transaction. Nowhere is this more evident than with mobile applications and the impact technology has on price transparency and location services. We intend to leverage these evolving technologies – and the trust that our customers have in the Walmart brand – to our advantage as we differentiate our business from other online retailers.” (Walmart Stores Inc. annual report 2011)</i>
			Recruiting talents with double competences in retail and digital commerce	<i>“The Barnes & Noble management team is led by experienced management in both traditional product lines and in digital eCommerce. The Barnes & Noble management team employs highly skilled professionals with both media expertise and supply chain management skills. This combination ensures a positive customer experience regardless of a customer’s preference for a physical product or a digital one.” (Barnes & Noble Inc. annual report 2010)</i>
			Changing organizational structure to adapt to the integration of different channels	<i>“As part of the comprehensive focus on its omnichannel business, the Company is building an efficient and resourceful organization that thrives on unrelenting creativity and innovation.” (Macy’s Inc. annual report 2010)</i>
			Incentive system linked to both online and offline sales	<i>“These Barnes & Noble.com employees participate in an incentive program tied to physical and digital eCommerce sales. The Company believes that the compensation of its management is competitive with that offered by other technology companies.” (Barnes & Noble Inc. annual report 2011)</i>

	A : WMT2008	B : WMT2009	C : WMT2010	D : WMT2011
1 : Access to online inventory and online orders fulfilled by staff in-store (3)	0	0	0	0
2 : Align assortment across channel (4)	0	0	0	0
3 : Align loyal program across channel (4)	0	0	0	0
4 : Align marketing message across channel (2)	0	0	0	0
5 : Align price across channel (4)	0	0	0	1
6 : Align promotion across channel (4)	0	0	0	0
7 : Align services across channel (4)	0	0	0	1
8 : Allowing online consumers to browse the inventory in-store (3)	0	0	0	0
9 : Buy online and return in-store (3)	0	0	0	0
10 : Centralized call center service across channel (4)	0	0	0	0
11 : Changing organizational structure for adapting to the integration of different channels (4)	0	0	0	2
12 : Click and pick-up in-store (3)	0	1	1	1
13 : Click-to-call (3)	0	0	0	0
14 : Different assortment policies in different channel (1)	0	0	0	0
15 : Different brand in different channel (1)	0	0	0	0
16 : Different price policies in different channel (1)	0	0	0	0
17 : Different service in different channel (1)	0	0	0	0
18 : Incentive system linked to both online and offline sales (4)	0	0	0	0
19 : Integrated marketing communication across channel (2)	0	0	0	0
20 : Integration of database of clients across channel (4)	0	0	0	0
21 : Integration of information systems across channel (4)	0	0	0	0
22 : Integration of logistics across channel (4)	0	0	0	0
23 : Integration of merchandise planning system across channel (4)	0	0	0	0
24 : Linkage between mobile app and store (3)	0	0	0	0
25 : Presence in different channels (website, catalog, kiosks, mobile, social media, call center) (1)	2	3	2	1
26 : Recruiting talents with double competences in retail and digital commerce (4)	0	0	0	0
27 : Sharing knowledge across channel (4)	0	0	0	1

Fig. 2. Evaluation results of cross-channel integration for Walmart, 2008–2011.

different channels (website, catalog, kiosks, mobile, social media, call center)” and “Click and pick up in-store,” which related to levels 1 and 3 respectively of cross-channel integration (see Fig. 2). Therefore, the level of cross-channel integration for Walmart in 2009 was 3. Following the same logic, this variable took values of 1, 3, and 4 for Walmart in 2008, 2010, and 2011, respectively (see Fig. 2).

We ensured the validity of our measure results in two ways. First, we validated interrater reliability by assigning a random proportion of the sample to a second researcher. According to Frey, Botan, and Kreps (2000), two coders should have at least a 20% overlap in coding materials. So a second coder examined a random sample of 90 firm-years (30% of the 271 total firm-years). The intercoder reliability coefficient was .92. Second, we compared our results with other available information, mainly that published by consultancy companies. The levels of cross-channel strategies we measured were similar to these external findings. For example, research conducted by Ebeltoft in 2011 indicated that Walmart was the top U.S. cross-channel retailer (Holder 2012); in our study, Walmart’s development in 2011 was at the highest level. Firm sales growth (“Sales growth”). Sales growth is the difference between the previous and current annual sales, divided by previous annual sales:

$$\text{Sales growth}_t = \frac{\text{sales}_t - \text{sales}_{(t-1)}}{\text{sales}_{(t-1)}}$$

where sales_t is the annual sales of time t and $\text{sales}_{(t-1)}$ is the annual sales of time $(t - 1)$.

Firm online experience (“E-commerce”). Firm online experience was approximated by the logarithm of the number of years in which the firm has operated its online sales, calculated as the difference between the current year and the year when the firm started selling online.

Physical store presence (“Stores”). Physical store presence was measured by the logarithm of the number of physical stores.

Control variables. We selected the control variables to include in this study using two criteria: They had been studied previously in multichannel retailing and performance literature, and relevant data were available. Thus we controlled for the effects on firm sales growth of advertising expenditures (Kwon and Lennon 2009; Steinfield, Adelaar, and Liu 2005), competitors’ relative advantage in moving toward cross-channel integration (Day and Wensley 1988; Hanssens 1980; King, Sen, and Xia 2004), competitive intensity (Avery et al. 2012; Jindal et al. 2007), industry dynamism (Oh, Teo, and Sambamurthy 2012), changes in working capital (Oh, Teo, and Sambamurthy 2012; Steinfield, Adelaar, and Liu 2005), and retail sector (Gensler, Dekimpe, and Skiera 2007; Oh, Teo, and Sambamurthy 2012; Steinfield, Adelaar, and Liu 2005). Advertising expenditures (“Advertising”) were approximated by the logarithm of annual advertising expenses. The measure of a competitor’s relative advantage in moving toward cross-channel integration (“Competitor relative”) was determined by comparing the cross-channel integration of the focal firm with that of its competitors in the subsector. We first calculated the median cross-channel integration of the focal firm’s competitors in the same subsector. If the median was higher than the focal firm’s value, we coded Competitor relative as 1; if the median was lower, we coded this variable as -1; and if the values were equal, Competitor relative was coded 0. Competitive intensity (“Competition”) was measured by 1 minus the Herfindahl index of the firm’s primary industry sales revenue. Industry dynamism (“Dynamism”) was measured by the standard deviation of sales in the firm’s primary industry over the previous four years, divided by average industry sales for those years. The change of working capital (“Wcapital”) was the difference

between current and former working capital, divided by former working capital. We also controlled for the seven retail sectors with dummy variables.

Estimation

We investigate whether cross-channel integration affects a firm’s sales growth and in what conditions. The data have a panel structure, in that we have time-series of observations for multiple firms. We chose a random effects model for our empirical study, because a fixed effects model would not work well with data for which within-cluster variation is minimal over time (e.g., retail sectors, controlled for in our regression model). Furthermore, we ran the Breusch and Pagan Lagrangian multiplier test for random effects. The result rejected the assumption that the variance of the unobserved fixed effects model was 0, so the random effects model was more appropriate for our study. We adopted the following random effects panel model and used Stata 12 to analyze it:

$$\begin{aligned} \text{Sales growth}_{it+1} = & \beta_0 + \beta_1 \text{Cross channel}_{it} + \beta_2 \text{Advertising}_{it} + \beta_3 \text{Competition}_{it} \\ & + \beta_4 \text{Dynamism}_{it} + \beta_5 \text{Wcapital}_{it} \\ & + \beta_6 \text{Competitor relative}_{it} + \beta_7 \text{Store}_{it} + \beta_8 \text{Cross channel}_{it} \times \text{Store}_{it} \\ & + \beta_9 \text{E-commerce}_{it} + \beta_{10} \text{Crosschannel}_{it} \times \text{E-commerce}_{it} + \varepsilon \end{aligned}$$

where *Sales growth_{it+1}* is the sales growth of firm *i* at time (*t* + 1), *Cross channel* the level of cross-channel integration, *Advertising* the firm advertising expenses, *Competition* the industry competitive intensity, *Wcapital* the change in working capital, *Dynamism* the industry dynamism, *Competitor relative*: the competitors’ relative advantage in moving toward cross-channel integration, *Stores* the physical store presence, and *E-commerce* is the firm online experience.

Prior research on multichannel strategies (e.g., Jindal et al. 2007) indicates that certain firm factors affect the level of multichannel usage, which may cause endogeneity issues. We therefore introduced a private-label dummy variable, as an instrumental variable in our tests. According to prior research (Steinfeld, Adelaar, and Liu 2005), a private-label strategy can have a direct impact on the adoption of cross-channel strategies, but it is unlikely to exert a direct effect on sales growth. We ran the Hausman test and the results² confirmed that cross-channel integration was exogenous.

Results

Descriptive statistics and correlation results. Table 4 summarizes the descriptive statistics, and Table 5 presents the Pearson correlation results. The median level of cross-channel integration was 2, the highest score achieved by any company was 4, and the lowest was 1. The average sales growth during the four-year study period was approximately 4.4%. The average retail-sector competition level reached .79, and mean sector

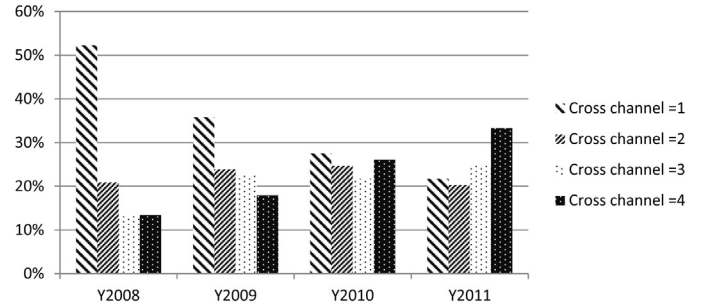


Fig. 3. Distribution of cross-channel integration.

dynamism was approximately 1.07. Each retailer in our sample maintained an average of 2,454 physical stores and spent an average of \$261,760 on advertising. Fig. 3 presents the distribution of cross-channel integration.

The Pearson correlation results (Table 5) indicated that the development level of cross-channel integration related positively to the following year’s sales growth, industry dynamism, change in working capital, firm online experience, and advertising expenditures.

Regression results. In Table 6, we present the results of the regression analysis for our model. We first present the main effect of cross-channel integration in Model 1, then introduce the moderating effects in Model 2. The significant, positive effect of cross-channel integration in both models (Model 1: *b* = .022, *p* < .05; Model 2: *b* = .105, *p* < .01) indicated that it stimulated sales growth, in support of H1.

Regarding the moderating effects of the firm-level factors, online experience negatively moderated the relationship between cross-channel integration and firm sales growth; the interaction term *Cross channel* × *E-commerce* was negative (*b* = −.02, *p* < .05) and significant. Thus, a retailer’s online experience reduced the positive effect of cross-channel integration on sales growth, in line with H2. Furthermore, the negative coefficient of *Cross channel* × *Stores* (*b* = −.006, *p* < .1) indicated that a large physical store network reduced the positive impact of a cross-channel strategy on sales growth, revealing the direction of the moderating effect we predicted in H3. Among the control variables, industry dynamism (*b* = .305, *p* < .05) and the change in working capital (*b* = .004, *p* < .05) appeared to have positive impacts on sales growth. The effects of industry competitive intensity, advertising expense, and competitors’ relative advantage in moving toward cross-channel integration on sales growth are not significant.

² Wu-Hausman *F* test: 0.09283, *F*(1,255) *P*-value = 0.76086. Durbin-Wu-Hausman chi-sq test: 0.09861, Chi-sq(1) *P*-value = 0.75350.

Table 4
Descriptive statistics.

Variable	Mean	Median	Std. dev.	Min	Max
<i>Cross channel</i>	2.3199	2.0000	1.1672	1.0000	4.0000
<i>Sales growth</i>	0.0440	.0455462	0.1000	-0.3352	0.3949
<i>Dynamism</i>	1.0681	1.086525	0.1913	0.5473	1.4875
<i>Competition</i>	0.7925	.8887152	0.2064	0.1214	0.9164
<i>Stores</i>	2454.09	1072.00	7546.03	2.00	86000.00
<i>Advertising</i>	260.76	85.00	406.57	0.83	2500.00
<i>E-commerce</i>	8.2794	10.0000	4.5021	0.0000	17.0000
<i>Competitor relative</i>	-0.0478	0.0000	0.7975	-1.0000	1.0000
<i>Wcapital</i>	0.2820	.0627829	3.1158	-4.0800	47.0079

Note: *Sales growth*: sales growth at time $(t + 1)$; *Cross channel*: level of cross-channel integration at time t ; *Advertising*: firm advertising expenses at time t ; *Competition*: industry competitive intensity at time t ; *Wcapital*: change in working capital at time t ; *Dynamism*: industry dynamism at time t ; *Competitor relative*: competitors' relative advantage in moving toward cross-channel strategies at time t ; *Stores*: physical store presence at time t ; and *E-commerce*: firm online experience at time t . *Advertising* and *E-commerce* are approximated by their logarithms in the regression analysis.

Table 5
Pearson correlation results.

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. <i>Cross channel</i>	1							
2. <i>Sales growth</i>	0.1201	**						
3. <i>Dynamism</i>	0.1636	***	-0.0651	1				
4. <i>Competition</i>	-0.0641		0.0265	-0.1682	***	1		
5. <i>Wcapital</i>	0.1175	*	0.1079	*	0.0031	0.056	1	
6. <i>Advertising</i>	0.1045	*	-0.1008	*	0.2618	***	-0.2932	***
7. <i>Competitor relative</i>	-0.7644	***	-0.0914		0.0258	-0.0353	-0.1012	*
8. <i>E-commerce</i>	0.1384	**	0.0679		-0.0102	-0.0957	0.0581	0.29
9. <i>Stores</i>	-0.0519		-0.2713	***	-0.0613	-0.0275	0.0065	0.2519

The definitions of all variables are provided in the notes to Table 4.

- * Significance at the 10% level.
- ** Significance at the 5% level.
- *** Significance at the 1% level.

Robustness Test

We treated the ordinal variable of cross-channel integration as an interval in the regression test, because prior studies note that most retailers adopt a maturity or stage-of-adoption model to develop their cross-channel integration (Chaffey 2010; Zhang et al. 2010). Therefore, the changes between two neighboring stages are gradual, not leaps, and we can assume that the distances between the scale items for cross-channel integration are not extremely large. In addition, the study of Bendixen and Yurova (2012) has pointed out that treating the ordinal variable as an interval leads not to changes in the relationship between the ordinal variable and other variables, but rather to changes in the meaning of the descriptive statistics. As a result, such treatment should not impact the validity of our hypotheses test, because only the coefficient direction was accounted for. However, the coefficient value of cross-channel integration needs to be used with caution, because of this equal interval assumption. This assumption creates some degree of uncertainty, so we ran additional tests in which cross-channel integration served as a category dummy variable. In all these models, the coefficients of

the dummies for cross-channel integration remained positive,³ indicating that our findings were robust.

We also conducted collinearity diagnostics, and no variance inflation factor values were greater than 5.4; this is not harmful according to Neter, Wasserman, and Kutner (1989). Finally, we ran simple slopes tests for each moderator to gain a better understanding of the interaction effects. Fig. 4 presents the results when we included *E-commerce* (Panel a) and *Stores* (Panel b) as a moderator. These results were consistent with the regression results, indicating that cross-channel integration had a stronger impact on sales growth when the values of *E-commerce* and *Stores* were relatively low.

Discussion

Increasing numbers of retailers engage in cross-channel integration, with the expectation of creating synergies and offering benefits to their consumers. However, for the question of whether

³ The results not reported are available on request from the authors.

Table 6
 Regression analysis (dependent variable: sales growth).

Variables	Hypotheses	Model 1		Model 2		
		Coef.	z	Coef.	z	
Intercept		0.162	1.07	-0.021	-0.13	
Main effects						
<i>Cross channel</i>	H1	0.022	2.33	0.105	3.19	**
Moderating effects						
<i>E-commerce</i>		0.009	0.76	0.047	2.31	**
<i>Cross channel × E-commerce</i>	H2			-0.020	-2.29	**
<i>Stores</i>		-0.019	-3.4	-0.007	-0.73	*
<i>Cross channel × Stores</i>	H3			-0.006	-1.65	
Control variables						
<i>Dynamism</i>		0.264	2.15	0.305	2.48	**
<i>Competition</i>		-0.168	-1.3	-0.179	-1.36	
<i>Advertising</i>		-0.004	-0.6	-0.003	-0.47	
<i>Wcapital</i>		0.004	2.04	0.004	2.16	**
<i>Competitor relative</i>		0.017	1.35	0.019	1.500	
<i>Time effect</i>		Controlled		Controlled		
<i>Retail sectors effect</i>		Controlled		Controlled		
R²						
Within		0.127		0.144		
Between		0.186		0.215		
Overall		0.150		0.183		
Significance		<0.001		<0.001		

The definitions of all variables are provided in the notes to Table 4.

- * Significance at the 10% level.
- ** Significance at the 5% level.
- *** Significance at the 1% level.

such desirable outcomes can be realized through cross-channel integration, little empirical evidence is available (Avery et al. 2012). Based on our analyses of a data set of 71 publicly traded U.S. retail firms from 2008 to 2011 (271 firm-year observations), our main effect finding confirms a positive influence of cross-channel integration on firm sales growth. As discussed in the “Conceptual Foundations” section, firms that better coordinate their multiple channels may improve consumers’ trust, increase their loyalty, boost their conversion rate, and create greater opportunities to cross-sell. As a result, a higher level of cross-channel integration may lead to firms experiencing higher sales growth.

Importantly, our results show that firm online experience and larger physical store presence negatively moderate the relationship between cross-channel integration and firm sales growth. It seems that firms with a stronger focus on a specific channel (i.e., online, as measured by online experience; or offline, as measured by physical store presence) benefit less from cross-channel integration. A plausible explanation is that the firms’ strong brand awareness through specific channels has already contributed to their customers perceiving reduced risk in purchasing through both this channel and the firms’ other channels. Such firms thus produce diminishing sales growth returns on cross-channel integration via improved trust on the part of their consumers. Another explanation may relate to consumers’ reluctance to move toward alternative channels from the channel with which they are familiar. In a firm with a stronger

focus on a specific channel, consumers are likely to be more reluctant to move away from this channel. Such firms’ cross-channel integration may thus have less of an effect on sales growth via a boosted conversion rate and greater opportunities to cross-sell.

Implications for Theory

We extend the research on multichannel retailing by providing fine-grained insights into the effects of cross-channel integration on firm sales growth. Although prior research (Berry et al. 2010; Neslin et al. 2006; Verhoef, Neslin, and Vroomen 2007; Zhang et al. 2010) has discussed some potential benefits and costs of channel coordination, it has not clarified how cross-channel integration increases or decreases firm sales. To address this knowledge gap, we identify four positive mechanisms and one negative mechanism; we also consider how these mechanisms are strengthened or weakened by firm-level factors.

This study advances understanding of the construct of cross-channel integration. Prior research (Berger et al. 2002; Neslin et al. 2006; Yan, Wang, and Zhou 2010) suggests that cross-channel integration is a process in which the degree of integration can range from complete separation of channels to full coordination (Neslin et al. 2006). Zhang et al. (2010) and Chaffey (2010) point out that most retailers should adopt a maturity or stage-of-adoption model to develop their cross-channel integration gradually. We extend the stage-of-adoption notion by

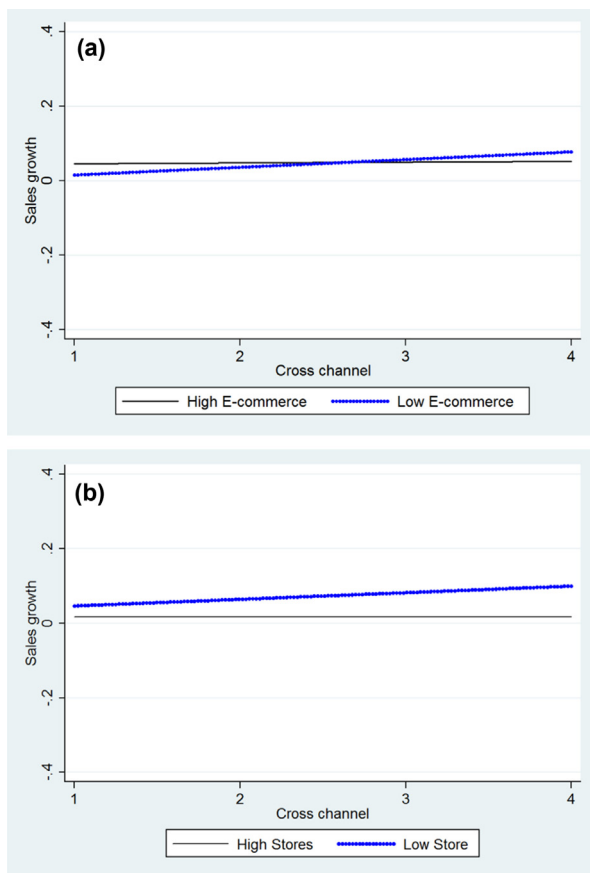


Fig. 4. Simple slope test for moderators. (a) Cross channel on Sales growth at E-commerce +/- 1sd. (b) Cross channel on Sales growth at Stores +/- 1sd.

classifying four evolutionary stages of cross-channel integration and identifying key indicators of each stage. This extension is crucial; it enables us to measure the construct from managerial and operational perspectives. Moreover, adding to prior studies that focus on front-end dimensions (Oh, Teo, and Sambamurthy 2012; Schramm-Klein and Morschett 2006), we include back-end dimensions, such as the integration of information systems and organizational transformation. Finally, rather than aggregating the various dimensions, despite their differing degrees of importance (Pentina and Hasty 2009; Steinfield, Adelaar, and Liu 2005), we specify the importance of each dimension by categorizing them into different stages of development in cross-channel integration.

Finally, we extend literature on channel additions beyond the effects of new or eliminated channels on firm performance (Cheng et al. 2007; Deleersnyder et al. 2002; Geyskens, Gielens, and Dekimpe 2002; Homburg, Vollmayr, and Hahn 2014; Konuş, Neslin, and Verhoef 2014; Kumar and Venkatesan 2005; Xia and Zhang 2010). Adding channels might cannibalize sales in other channels, but prior research focusing on conceptual frameworks (Stone, Hobbs, and Khaleeli 2002; Verhoef 2012; Zhang et al. 2010) has suggested that an appropriate channel combination can reduce channel conflicts. Neslin and Shankar (2009) even provide an economic argument that cross-channel integration may increase firm sales. Our findings provide further empirical evidence for this assumption and confirm the positive

influence of cross-channel integration on firm sales growth. As Zhang et al. (2010) recommend, studies need to investigate which types of multichannel retailers, and in what conditions, are more likely to suffer from cannibalization or lack of synergy. Prior research (Oh, Teo, and Sambamurthy 2012) has investigated contingency factors that affect the relationship between cross-channel integration and firm performance, but it is focused on the industry-level factor. We augment this research by testing moderating hypotheses that are related to firm-level factors. Our empirical results thus deepen understanding of the effect of cross-channel integration on firm sales growth by expanding the set of moderators. Firm online experience and physical store presence negatively moderate the effect of cross-channel integration on firm sales growth, in contrast with the RBV, which implies that firms with more resources can better leverage their cross-channel integration (Oh, Teo, and Sambamurthy 2012; Steinfield, Adelaar, and Liu 2005; Zhang et al. 2010). Instead, our result is in line with research into the lock-in effect of online experience (Biyalogorsky and Naik 2003) and complex consumer behaviors in multichannel contexts (Balasubramanian, Raghunathan, and Mahajan 2005; Benedicktus et al. 2010; Falk et al. 2007; Konuş, Verhoef, and Neslin 2008).

Implications for Practice

According to our results, multichannel retailers should integrate their multiple channels to increase firm sales, though the positive effect is contingent on several firm-level factors. First, traditional store-based retailers that lag behind in developing online channels should seize the opportunities associated with multichannel integration to increase their sales. Cross-channel integration boosts sales growth for firms with less online experience, so integration across channels offers an effective way for traditional, store-based retailers to “catch up” in their sales growth, assuming they can leverage their physical stores and existing distribution capabilities.

Second, retailers should re-evaluate their physical store networks and optimize their size by closing, relocating, or remodeling physical stores while implementing their cross-channel integration. Firms with larger physical store networks benefit less from coordination activities across channels. Although the physical store, when it is equipped with new technologies and accessible through consumers’ smartphones, can act as a hub that links different channels and creates value for the retailer (Ono et al. 2012), an overly intensive network may produce channel conflicts and result in dissynergies (Falk et al. 2007). Before closing stores, though, retailers should recognize some limits of this study. The significance level for this finding was relatively weak, so the moderating effect of physical store presence on the relationship between cross-channel integration and firm sales growth needs further confirmation. Considering the complexity of consumer behaviors in multichannel contexts (Balasubramanian, Raghunathan, and Mahajan 2005; Dholakia et al. 2010; Konuş, Verhoef, and Neslin 2008; Verhoef, Neslin, and Vroomen 2007), eliminating a channel or reducing the intensity of the physical store network could have additional, uncertain outcomes (Konuş, Neslin, and Verhoef 2014). We

also focus only on sales growth as an outcome of cross-channel integration; we cannot comment on the profit consequences of closing stores.

Limitations and Suggestions for Further Research

This research has several other limitations; these also suggest directions for further research. First, we focus on sales growth to evaluate the effectiveness of cross-channel integration, but sales increases often take time to materialize. Considering the costs required to support changes in the marketing processes and infrastructures, the concentration of consumer databases, and the reconfiguration of the organization, company profitability may decline in the meantime. Further research should investigate the short- and long-term impacts of cross-channel integration on firm profitability. Studies might propose hypotheses from both demand and supply sides, and then investigate them using data over a sufficiently long timeframe.

Second, research could expand the set of potential moderators of cross-channel integration effects, beyond firm-level contingencies. For example, corporate governance, customer heterogeneity, and technological uncertainty may affect the outcomes of cross-channel integration (Brettel, Engelen, and Müller 2011; Jindal et al. 2007; Zhang et al. 2010). A firm's underlying motives for cross-channel integration (e.g., reacting to competitive actions, driving the market, and reacting to customer expectations) also could affect value creation.

Third, our measurement tool emerged from a qualitative, grounded theory approach, and we sought to make it more meaningful by comparing it with previous research. We applied various techniques to improve the reliability of our measure, but subjectivity issues remain a concern. A complementary survey of firm managers could help validate our measure of cross-channel integration, through data triangulation.

Fourth, the timeframe for our study is four years. Zhang et al. (2010) call for caution when evaluating the effectiveness of a multichannel retailing program using short-term results. This development is still relatively new to the retail industry, so we lack sufficient data to test the long-term effects of cross-channel integration on firm sales growth. Studies should include more data, pertaining to the years following 2011, once they are available.

Fifth, using longitudinal data from publicly traded U.S. retailers gathered from secondary sources has important advantages (e.g., diverse cross-channel development, competitiveness, and public availability of data). However, our findings may be specific to this research setting, though our broad conceptual framework suggests a means to generalize our hypotheses to other settings. Replications of our study in other economies would be welcomed.

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