Journal of Operations Management xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Journal of Operations Management

journal homepage: www.elsevier.com/locate/jom

Assessing impacts of introducing ship-to-store service on sales and returns in omnichannel retailing: A data analytics study

M. Serkan Akturk[a,*], Michael Ketzenberg[b], Gregory R. Heim[c]

[a] College of Business, Clemson University, 100 Sirrine Hall, Clemson, SC, 29634-1305, United States
[b] Mays Business School, Texas A&M University, 4217 TAMU, College Station, TX, 77843-4217, United States
[c] Mays Business School, Texas A&M University, 4217 TAMU, College Station, TX, 77843-4217, United States

ARTICLE INFO

Accepted by: T. Browning

Keywords:
Omnichannel retailing
Ship-to-store
Channel integration
Consumer returns

ABSTRACT

Omnichannel retailing features, such as ship-to-store (STS) service, are designed to deliver a seamless shopping experience for customers. For a retailer, introducing omnichannel capabilities requires major investments to integrate physical stores and online marketplaces, yet holds a promise of potentially enhancing revenue streams from both brick-and-mortar (BM) stores and online store channels. We assess the promise of ship-to-store capabilities by analyzing transactional data from a national jewelry retailer to study impacts of introducing ship-to-store on a retailer's operating performance, in terms of sales and customer returns. Contrary to expectations, the findings show that online sales decreased after ship-to-store was introduced, although BM store sales increased. Detailed analysis of the transactional data suggests that, after STS implementation, some customers switched from the online channel to the brick-and-mortar channel. This switch occurred mainly for high-value purchases. The customers who actually remained with and fully completed a sale using the ship-to-store service typically were those that bought low-value items. Our findings also suggest that introducing ship-to-store increased cross-channel customer returns of online purchases to physical stores. Concurrently, these new ship-to-store returns generated additional BM store sales. The paper contributes by showing how introducing ship-to-store service can have different impacts in terms of sales and returns across a retailer's channels.

1. Introduction

We assess impacts of introducing *ship-to-store* service on retailer sales and customer returns across multiple retailing channels. With the advent of technology-enabled shopping alternatives, retailers began augmenting their retailing channels with many new service processes, the collection of which has evolved into what today is known as *omnichannel retailing*. The main focus of omnichannel retailing is to offer consumers a seamless shopping experience, no matter which channel they use (Rigby, 2011; Brynjolfsson et al., 2013; Bell et al., 2014). With omnichannel retailing, customers can buy online, buy in stores, or buy via several other shopping modes (e.g., catalogs, mobile devices). Among the many models of omnichannel purchasing and order fulfillment, major retailers today offer *buy-online and pick-up-in-store*, *ship-to-store*, *ship-from-store*, and *reserve-online and pick-up-in-store* services to meet customer expectations.

Many omnichannel service processes are designed to draw customers into physical stores (RIS, 2012; MA, 2014) and thereby increase store traffic (Yantra, 2005; Lieb, 2015). Retailers do this via purchase options such as *ship-to-store* or *buy-online and pick-up-in-store*, as well as via return options such as *buy-online-return- to-store* (Zhang et al., 2010). Store traffic is essential to increase sales (Gulati and Garino, 2000; Bell et al., 2014), either through impulse purchases or through the assistance of store employees (Fisher and Raman, 2010; Mani et al., 2015). For example, at the national jewelry retailer we study, employee guidelines and training materials indicate that ship-to-store and buy-online-return-to-store events are important selling opportunities. For ship-to-store, sales associates are directed to use the occasion to cross-sell accessories and attendant items, along with profitable services like warranties. For returns, the selling prescription for the salesperson is to convert the return into an exchange or to up-sell to a more expensive item.

From a customer's perspective, the benefit of omnichannel integration is an increase in the value proposition offered by retailers (Gallino and Moreno, 2014; Gao and Su, 2017a) due to lower transaction costs, higher service quality, and lower perceived risk (Herhausen et al., 2015). With ship-to-store service, another customer benefit is a perceived increase in product variety because retailers can augment physical store inventory with virtual inventory offered on the Internet (Radial, 2016).

* Corresponding author.
E-mail addresses: makturk@clemson.edu (M. Serkan Akturk), mketzenberg@mays.tamu.edu (M. Ketzenberg), gheim@mays.tamu.edu (G.R. Heim).

https://doi.org/10.1016/j.jom.2018.06.004
Received 26 October 2016; Received in revised form 20 June 2018; Accepted 22 June 2018

The envisioned benefits of omnichannel retailing for retailers and customers have not been lost on practitioners, as evidenced by the sheer number of retailers pursuing omnichannel strategies. Even so, retail executives still worry about introducing effective omnichannel processes. To date, little academic research has studied the efficacy of omnichannel retailing tactics to stimulate demand, drive store traffic, or enable customer returns, which we address.

While omnichannel retailing provides benefits to customers, and ostensibly to retailers, implementation by necessity involves the adoption of costly and difficult-to-implement information and material handling technologies that can generate new operational challenges (Davis, 2008; Zhang et al., 2010). Omnichannel retailing requires integrating promotion campaigns, assortment planning for online and offline channels, inventory systems, and warehouses (Gallino and Moreno, 2014). It also can require multi-channel order management systems, integration to third-party partners, and many other internal or outsourced retailing systems (Perdikaki et al., 2015). Historically, retailers have had a hard enough time accurately tracking their store inventory in the first place (DeHoratius and Raman, 2008), let alone having the capability to offer inventory visibility across multiple channels in a real-time manner. As a case in point, while 60% of retailers in a recent survey claim they have implemented inventory visibility across channels, 80% of them report that their systems need improvement due to implementation issues (BRP, 2016). Thus, there is a clear tradeoff between the costs and challenges associated with implementing omnichannel retailing and the benefits that may arise from such systems. Complicating matters is that there is a variety of omnichannel process alternatives, each having different operational complexities and distinctive value propositions.

This paper focuses on implications of introducing *ship-to-store* service. Although some people may use the terms *ship-to-store* (STS) and *buy-online and pick-up-in-store* (BOPS) interchangeably, the two are in fact largely different service processes with different fulfillment tradeoffs (Acimovic and Graves, 2015). In short, BOPS provides customers with real-time store-level product availability information, lets customers complete transactions online, and allows customers very soon thereafter to pick up the items in a store at their convenience (Gao and Su, 2017a). BOPS reduces shopping transaction costs for customers since items are picked and packed by store employees prior to customer pick-up. In contrast, with STS, customers complete a purchase transaction online, and then wait for a notification about delivery of purchased items to their local stores, free of charge. With STS, shipping of items from a central distribution center (DC) generally occurs, even if the item is already available at the store, as is the case with the retailer we study. Hence, BOPS uses in-store inventory to fulfill customer demand, while STS uses centralized fulfillment.

In practice, we observe many variations of BOPS and STS processes, including hybrids of the two, with some involving local store-to-store inventory transshipment. Table 1 compares eight national retailers in terms of the BOPS or STS features that they offer to customers. Clearly, there is no single omnichannel strategy that retailers are pursuing. We thus are left to wonder why a retailer chooses to offer a variant of such services. Academic research adds little clarity. We are aware of only two research works that address BOPS (Gallino and Moreno, 2014; Gao and Su, 2017a) and only one that addresses STS (Gallino et al., 2017). Clearly, this gap in the literature, compared against the extensive offerings of these omnichannel services in the marketplace, signals a significant research opportunity.

Table 1
BOPS vs. STS.

Firms	Offers BOPS	BOPS lead time	Offers STS	STS lead time
Walmart	Yes	4 h	Yes	7-10 business days
Best Buy	Yes	45 min	Yes	3-7 business days
Lowe's	Yes	20 min	No	–
Kohl's	Yes	4 h	No	–
Macy's	Yes	4 h	No	–
REI	No	–	Yes	7-10 business days
Michaels	No	–	Yes	5-7 business days
Kirkland's	No	–	Yes	7-10 business days

In this paper, we empirically investigate the impact of introducing STS service on a retailer's operations by using a series of quasi experiments. We use the difference-in-difference (DID) econometric methodology to compare the pre and post periods of STS introduction. To do so, we collected a proprietary data set from a national jewelry retailer that implemented STS service. As with virtually all fashion items, jewelry is an experience good, and because of this, there is a significant risk of an item in this product category getting returned, since the customer is only able to assess its quality and fit after it is received.

The data set in its entirety spans four years with more than 20 million customer-level purchase and return transactions. The jewelry retailer operates more than 1000 stores in the U.S. and Canada. Using a subset of this data set that corresponds to a two-year time window (one year before and one year after) surrounding the point in time of the STS introduction, we are able to observe how purchase and return activities of customers change after the retailer introduced the new STS service and how these changes affect retailer performance.

Given the nascent state of research, we are positioned to make several contributions. Building on firm-level transaction cost theory and consumer utility maximization, we develop research hypotheses regarding the STS service. Theoretical reasoning leads us to hypothesize that both online and brick-and-mortar (BM) channel sales should increase after introduction of STS. Overlapping the findings of Gallino and Moreno (2014) for BOPS in furniture/housewares retailing, we do find that BM store sales increase after the jewelry retailer's STS rollout, while at the same time online sales actually decline post-STS. Moreover, the increase in BM sales is larger than the decrease in online sales. Plainly, there is more to the story than a simple channel shift of demand. A key point to note as well is that the theoretical underpinning for an increase in BM store sales resides with an increase in online sales. Ostensibly, the new availability of STS should directly stimulate online demand, and through the process of store pick-ups, generate store traffic and hence store sales. Yet, we find that online sales *decline*. Clearly, with this retailer's introduction of STS, a more nuanced explanation is needed.

In short, after digging into details within customer transaction data, we find that while customers may be drawn via STS service to make purchases online, many customers subsequently decide not to wait for store delivery, and instead opt to go directly to a store and immediately buy similar merchandise. This activity occurs mainly for high-value items. What is striking here is that there is no way for customers to know with certainty that the specific items they are interested in are even available at the store, since store inventory information is not made available online. In fact, only roughly half of the items available via STS are also available in stores, so long as they are not out-of-stock. We speculate that the research that customers conduct online makes them comfortable enough to believe that the selection offered in local stores will satisfy their needs, whether or not the online item is immediately available. In contrast, the online customers who do end up using STS are customers that mainly purchase low value items, for which the relative savings in shipping cost afforded by STS is disproportionately greater. This finding contributes by showing how a new STS service can lead to non-uniform customer actions across retail channels.

Another facet regarding STS introduction is its effect on product returns. We find that cross-channel customer returns increase. We also find that product returns of sales made at BM stores decrease, while returns for online purchases remain unchanged. Customers who switch from pure online shopping to STS service via the BM channel have conducted prior research online, thus they should be more knowledgeable about their purchases compared to regular BM customers. This