

Brand repurchasing in channel switching: insights from omnichannel grocery retailing

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Abstract

Purpose – This study aims to examine customers' inertial brand repurchasing behavior in omnichannel grocery retailing. It identifies the conditions under which continuing to use the same channel or switching channels leads to a stronger or weaker impact on brand repurchasing. In addition, it evaluates the moderating effect of customers' private label purchasing.

Design/methodology/approach – This study uses a representative Japanese purchase panel data set from three years, including 4,071 unique customers from three major omnichannel grocery retailers. Customers' brand repurchasing rates in shopping baskets are modeled, and the main effect of the channel switching pattern and the moderating effect of customers' private label share are evaluated. To address the issue of customer self-selection in channel switching, propensity score analysis is applied.

Findings – Customers tend to repurchase brands when they continue using the same channel rather than switching channels. This tendency is stronger when continuing with online channels. In addition, the repurchasing rate is higher when customers switch from offline to online than from online to offline. Furthermore, private label share has a moderating effect on this relationship.

Research limitations/implications – This study offers a new perspective on omnichannel grocery retailing by highlighting that inertial behavior is stronger in online grocery shopping and elucidating brand trialability and the discovery role of physical stores in channel switching from offline to online.

Practical implications – The findings provide managerial implications for retailers to enhance omnichannel strategies, including assortment management and private label strategies.

Originality/value – This novel study investigates inertial behavior during channel switching across consecutive shopping trips, revealing the conditions that affect this behavior.

Keywords Omnichannel retailing, Grocery, Brand repurchasing, Channel switching, Private labels

Paper type Research paper

Introduction

Brand repurchasing has been attracting considerable interest, particularly in grocery retailing, where customer decisions are often driven by habitual behavior (Dubé *et al.*, 2010; Henderson *et al.*, 2021; Hoyer, 1984; Wood and Neal, 2009). While it is typically considered essential for manufacturers, understanding this behavior is also crucial for retailers. Retailers benefit when customers find their favorite brands and revisit stores to engage in repurchasing, thereby leading to high profitability (Chintagunta, 1998; Koll and Plank, 2022). In addition, in the recent

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retailing environment, research interest in brand repurchasing has expanded to include online shopping (Chintala *et al.*, 2024; Guo and Wang, 2024). The COVID-19 pandemic substantially accelerated online purchasing (Szász *et al.*, 2022; Verhoef *et al.*, 2022). In response, retailers have strengthened strategies such as loyalty programs, recommendations, personalization and subscriptions to encourage repeat purchases online (e.g. Gai and Klesse, 2019; Shopify, 2024; Tyrväinen *et al.*, 2020). This focus is particularly significant in omnichannel grocery retailing, where inertia and habitual purchasing patterns synergistically influence customer behavior both online and offline (Chintala *et al.*, 2024; Henderson *et al.*, 2021; Nakano, 2023).

Research on grocery shopping, which often involves routine purchases, has shown that habit plays a key role in consumer behavior (Wood *et al.*, 2002; Wood and Neal, 2009). Repeat purchases driven by habit do not necessarily indicate strong positive brand evaluations that reflect attitude loyalty (Dick and Basu, 1994; Watson *et al.*, 2015). Rather, customer behavior tends to be shaped by contextual cues and the stability of those cues (Henderson *et al.*, 2021; Wood and Neal, 2009). In physical stores, past choices and the surrounding physical and social settings influence customer behavior. When contextual cues are consistent between the previous and current shopping occasions, customer choices are influenced by those cues (Bawa, 1990; Chintagunta, 1998; Koll and Plank, 2022). This pattern of behavior contributes to the formation of an inertia mindset (Henderson *et al.*, 2021). Notably, in the current grocery retailing environment, this inertia may have become even stronger in online shopping. The variety of products in a customer's shopping basket may be smaller in online shopping than in physical stores, making it easier for customers to repurchase the same items (Chintala *et al.*, 2024; Nakano, 2023). Furthermore, the inability to physically inspect products online may encourage customers who are prone to uncertainty avoidance to buy the same products repeatedly (Guo and Wang, 2024).

Despite extensive research interest in brand repurchasing in physical stores and online channels, it is unclear how this inertial behavior persists when customers switch channels. Even if purchases are made in succession within the same retailer, a break in inertia may arise when customers change channels. This issue becomes more critical when retailers use omnichannel strategies. This is because, in omnichannel retailing, it is necessary to enhance customer experience not in a single shopping trip but across multiple trips and develop long-term loyalty loops (Neslin, 2022; Siebert *et al.*, 2020). Research on inertia across consecutive shopping trips has been conducted mainly in physical store settings (e.g. Bawa, 1990; Chintagunta, 1998; Koll and Plank, 2022). However, there remains a gap regarding inertia when customers switch across different channels, such as from offline to online or from online to offline. Addressing this distinction is theoretically important, as it enables researchers to extend habit theory by incorporating the concepts of contextual cues and their stability into the omnichannel retailing literature. From a managerial perspective, this distinction also provides insights into how retailers can connect customers' in-store purchase habits with online shopping, where pre-existing reputation and trust are more influential and signaling effects play a larger role (Gielens *et al.*, 2021). Thus, examining brand repurchasing under channel switching is important for guiding future integrated marketing strategies in omnichannel grocery retailing.

The novelty of this study lies in examining whether customer inertia becomes stronger in an omnichannel setting. To address this question, the study investigates differences in brand repurchasing behavior when customers switch channels (offline to online or online to offline) or continue using the same channel (offline to offline or online to online). It examines the shopping basket structure in omnichannel grocery retailing and explores how retailers can manage customer inertia. Furthermore, this study highlights the role of private labels as a factor that may strengthen the relationship between channel switching and brand

repurchasing. Private labels act as signals of quality, and this signaling effect is expected to be stronger in online purchases, where customers face more limited cues than in physical stores (Gielens *et al.*, 2023; Verstraeten *et al.*, 2023; Volles *et al.*, 2023). These quality signals may help stabilize customer perceptions in situations where contextual cues become less consistent between shopping trips – particularly when customers switch channels. This study empirically examines whether customer inertia becomes stronger in omnichannel settings as customers gain experience in purchasing private labels.

This research is based on representative Japanese purchase panel data, which include customers' purchases from several major omnichannel grocery retailers. It examines how the continuity or switching of channels between online and offline affects a customer's tendency to repurchase the same brand in a shopping basket. Propensity score analysis was used to address the issue of customer self-selection in channel switching. The findings show that when customers continue using the same channel, the brand repurchasing rate in their shopping baskets is higher than when they switch channels. This tendency is stronger when continuing with online channels as compared to physical stores, highlighting the strength of customer inertia in online shopping. In addition, switching channels reduces brand repurchasing, but the repurchasing rate when switching from offline to online is higher than that when switching from online to offline. This result emphasizes the importance of physical stores as places for brand exploration and discovery (Grewal *et al.*, 2023; Guo and Wang, 2024; Pozzi, 2012). This study also finds that the customer's private label share, defined as the proportion of past purchases comprising private labels, functions as a quasi-moderator (Sharma *et al.*, 1981). Not only is there a main effect of private label purchasing on brand repurchasing (Koll and Plank, 2022), but there is also a moderating effect such that, across all channel switching patterns, the higher the private label share, the greater the repurchase tendency. This indicates that private label purchases play a complementary role in counteracting brand repurchasing weakening during channel switching. These findings remain robust even when controlling for the available product assortments across channels.

The contributions of this study to the literature are twofold. First, this study extends the research on customer inertia in brand purchasing (e.g. Bawa, 1990; Chintagunta, 1998; Henderson *et al.*, 2021) by incorporating the concept of channel switching in omnichannel retailing. This perspective advances understanding of how inertial consumption functions across online and in-store shopping contexts. Drawing on habit theory (Wood and Neal, 2009), prior studies have shown the relationship between the stability of contextual cues and brand repurchasing in in-store shopping environments (Koll and Plank, 2022). This study builds on this idea in an online setting and further clarifies the impact of the relationship between customers' past and current channel choices, highlighting the impact of specific channel transition patterns on brand purchases. Therefore, it helps develop strategies for omnichannel grocery retailing by aligning brand and retailer channel management to build long-term customer relationships. Second, this study contributes to the literature on private label management. It highlights that private label purchases function as contextual cues across shopping trips, thereby reinforcing customer inertia (Koll and Plank, 2022). The uniqueness of this study lies in demonstrating that this mechanism is amplified in an omnichannel environment. Specifically, it shows that increased private label purchasing experience strengthens brand repurchasing tendencies, both when continuing with the same channel and when switching channels. These findings also contribute to the literature on private label trust and perceived risk reduction (Konuk, 2020; Liljander *et al.*, 2009) as well as to the literature on brand–retailer relationships (Ailawadi *et al.*, 2008; Hoskins *et al.*, 2024; Koschate-Fischer *et al.*, 2014). From a managerial perspective, these implications can help retailers optimize channel integration and brand allocation strategies.

Literature review*Customers' repeated purchases of the same brand across channels*

The mechanisms underlying customers' repeated purchases of the same brand are primarily explained by two theoretical perspectives: brand loyalty (Dick and Basu, 1994; Oliver, 1999; Watson *et al.*, 2015) and habit theory (Wood *et al.*, 2002; Wood and Neal, 2009). Brand loyalty, particularly attitudinal loyalty, refers to an emotional attachment to the brand. Unlike behavioral loyalty, attitudinal loyalty reflects the belief that purchasing the brand fulfills a valued goal or results in positive emotional experiences (Dick and Basu, 1994; Oliver, 1999; Park *et al.*, 2010; Watson *et al.*, 2015). On the other hand, in grocery shopping, habit also has a significant influence on customer choice (Hoyer, 1984; Wood and Neal, 2009). Because grocery purchases are frequently repeated and carry low involvement, they tend to become "routinized habits" (Dubé *et al.*, 2010; Henderson *et al.*, 2021; Shi and Zhang, 2014; Verstraeten *et al.*, 2023). In such cases, brand repurchasing behavior is primarily driven by habit rather than by a strong positive evaluation of the brand.

Once habits have been established, customers tend to make more conservative and familiar choices (Wood and Neal, 2009). This behavior can also be explained by status quo bias theory (Samuelson and Zeckhauser, 1988). Habitual behavior contributes to the emergence of customer inertia, a concept that draws on the metaphor of the inertial property of matter in physics. It refers to the empirical regularity in which past purchases strongly predict similar future purchases (Bawa, 1990; Dubé *et al.*, 2010; Henderson *et al.*, 2021). Henderson *et al.* (2021) explain customer inertia through the lens of psychological mindset theory (Price *et al.*, 2018). According to this view, an inertia mindset emerges from the consistency and magnitude of prior consumption, which fosters psychological inclinations toward reduced cognitive effort and regret minimization. These mechanisms reinforce the inertia mindset and promote repeated purchasing behavior.

Nevertheless, inertial customer behavior is not always permanent. When customers begin to seek variety or stimulation, their inertia may weaken and no longer be effective (Bawa, 1990; Chintagunta, 1998). In highly competitive markets, new entrants have the potential to disrupt existing inertia (Moe and Yang, 2009; Siebert *et al.*, 2020). Moreover, recent findings indicate that interventions aimed at re-engaging customers in inertia mindsets may even have negative effects (Henderson *et al.*, 2021). Therefore, retailers should acknowledge the nature of customer inertia and adopt strategies that reflect this awareness.

To understand both the persistence and change of inertia, a key construct is the role of contextual cues and their stability (Wood *et al.*, 2002; Wood and Neal, 2009). Stable contextual cues refer to situations in which preceding actions, physical location or social settings remain consistent across repeated choices (Koll and Plank, 2022; Wood and Neal, 2009). These cues act as triggers that directly activate habitual responses stored in customers' memories. In grocery shopping in physical stores, several factors can recreate similar situations to past experiences, such as planned purchases (Bell *et al.*, 2011), advertising (Freimer and Horsky, 2012), price promotions (Gupta *et al.*, 1997) and product assortment (Chintagunta, 1998). More recently, Koll and Plank (2022) examined contextual cues in physical stores and found that when the context of the retailer, basket size, day of the week and private label from the previous purchase is stable, the likelihood of brand repurchasing significantly increases. These findings indicate that inertial influences significantly shape customer behavior in in-store shopping environments.

In recent years, there has been growing interest in how this habitual customer behavior differs between online and physical stores (Chintala *et al.*, 2024; Guo and Wang, 2024; Nakano, 2023). When considering grocery purchases in e-commerce, several features are designed to reinforce customer inertia. For instance, previously purchased items are often

recommended again, and customers can easily access their order histories, which serve as cognitive shortcuts for repeat choices. The question of whether inertia is more pronounced online or in physical stores has been studied, but the findings from early and recent studies vary. Early research findings are mixed. Some studies suggest that brand switching is more prevalent in online shopping due to the simplicity of selecting products with a single click (Lynch and Ariely, 2000; Moore and Andradi, 1996). Conversely, with progress in research, especially in the online grocery literature, there is growing empirical evidence that online shopping fosters inertial behavior.

Two perspectives help explain this phenomenon. One is the difference in brand exploration. Degeratu *et al.* (2000) argue that narrowing online search targets reduces price sensitivity and limits brand switching. Pozzi (2012) compares the propensity to search for new brands between channels and demonstrates that brand exploration is weaker online than in physical stores. In a recent study, Guo and Wang (2024) demonstrate through experiments across multiple categories, including groceries, that customers with a strong tendency to avoid uncertainty exhibit higher online loyalty. Thus, online shopping tends to be valued for its convenience and the smoothness of the selection process, whereas physical stores may increasingly be viewed as spaces for experience and discovery (Grewal *et al.*, 2023).

Another explanation is the difference in products purchased online versus in physical stores. Chintagunta *et al.* (2012) have observed that heavy and bulky items are more likely to be purchased online, while products that require physical inspection, such as perishables, are more commonly purchased in physical stores. In addition, online shopping baskets show less variation than in-store baskets, suggesting that customers tend to continue buying items that are part of their routine. Campo and Breugelmans (2015) outline that the functional online shopping goal makes it more difficult for customers to impulse buy, meaning daily or regular items are more likely to shift online than offline. Furthermore, Chintala *et al.* (2024) have found that the diversity of online grocery shopping baskets is significantly lower than offline baskets. This suggests that in online shopping, purchases with a high degree of similarity are likely to be made between shopping trips. In related research, Nakano (2023) has demonstrated that when comparing online and physical store grocery baskets, demand for popular products tends to be more concentrated online. Chintala *et al.* (2024) and Nakano (2023) further highlight a notable decrease in the diversity of shopping baskets in online grocery shopping. In summary, online shopping tends to promote more functional purchasing, leading to lower diversity in the shopping basket.

Channel switching in omnichannel retailing

Customers often continue using the same channel, but they also switch between channels. In such cases, understanding how inertia influences brand repurchasing is important, yet this area remains relatively underexplored in the literature. From a managerial perspective, analyzing differences across shopping trips, particularly the composition of individual shopping baskets, can provide valuable insights into customers' brand repurchasing behavior. Retailers can use these patterns to design promotions and recommendation strategies, and to develop mechanisms that leverage inertia during channel switching to support profitability. Over the past two decades, a growing body of research has examined consecutive shopping trips across online and offline channels. Early studies have modeled customers' retail channel choices and examined the effects of inertia, state dependence and accumulated past purchasing experience (Ansari *et al.*, 2008; Chintagunta *et al.*, 2012; Valentini *et al.*, 2011). More recently, studies have begun to examine the composition of shopping baskets across online and offline shopping trips (Chintala *et al.*, 2024; Nakano, 2023). However, these studies mainly focus on direct comparisons between online and

offline channels, rather than explicitly addressing channel switching as a central research question.

In this study, channel switching is defined as the transition between the channel used for a customer's previous purchase and that for their current purchase. This is different from switching between channels during the search and purchase process, such as "showrooming" or "webrooming" (Neslin, 2022; Verhoef *et al.*, 2007). Because grocery purchases are usually influenced more by decisions made at the time of buying than by searching for information (Dubé *et al.*, 2010; Neslin, 2022), this study focuses on differences in the shopping basket between the purchase at time $t - 1$ and that at time t .

Channel switching can be classified into two types: from offline to online and from online to offline. Compared to continuous use of the same channel (i.e. online channel continuation or offline channel continuation), these switching patterns are likely to exhibit lower contextual cues stability. This is plausible, given that factors such as basket size and situational conditions (e.g. day of the week, time of day and weather) often differ between online and offline grocery shopping (Chintagunta *et al.*, 2012; Chintala *et al.*, 2024). Despite its relevance, research has rarely focused on the role of inertia during channel switching. Table 1 positions the focus of this study in relation to the existing grocery retailing literature for customer inertial behavior.

The role of private labels

If the strength of customer inertia varies across different types of channel switching, it is important to understand what strategies retailers can adopt to promote more seamless channel switching and reinforce habitual purchasing behavior. Based on the findings of Koll and Plank (2022), who identified private labels as strong contextual cues in physical retail settings, this study explores the role of private labels in shaping brand repurchasing behavior during channel switching. Private label sales constitute a controllable marketing instrument, and their strategic relevance has increased due to their potential to improve retailers' profitability (Ailawadi *et al.*, 2008; Gielens *et al.*, 2021). Retailers have expanded private labels assortment beyond low-priced options (i.e. economy private labels) to include labels with relatively higher quality (i.e. value private labels), superior quality and high prices (i.e. premium private labels) and environmentally sustainable features (i.e. smart private labels) (Gielens *et al.*, 2021). When private labels offer relatively high quality and a wide variety of product assortments, prioritizing the expansion of private label share can serve as an effective retail strategy (Ailawadi *et al.*, 2008; Hoskins *et al.*, 2024).

The role of private labels as contextual cues across online and offline settings can potentially be explained through quality signals and cue utilization theory (Olson and Jacoby, 1972). Private labels extend across multiple product categories. As a result, when they build a favorable reputation, that reputation can serve as a quality signal more broadly across categories than a single national brand (Gielens *et al.*, 2021). A strong reputation built by a private label in one category can transfer to private labels in other categories. This spillover can lead to a meaningful managerial impact.

Furthermore, this signaling effect tends to be even stronger in online shopping environments (Gielens *et al.*, 2023; Verstraeten *et al.*, 2023; Volles *et al.*, 2023). In online shopping, customers tend to perceive purchase risk as higher and are therefore more likely to choose established and trusted brands to avoid uncertainty (Degeratu *et al.*, 2000; Guo and Wang, 2024). While grocery purchase decisions are often guided by heuristics, the available cues are more limited online than in physical stores. These cues include price, brand name, sensory attributes (such as visuals, smell, touch and sound) and functional information (such as ingredients or place of origin) (Verstraeten *et al.*, 2023). However, sensory attributes

Table 1. Literature overview for customer inertial behavior in grocery purchases

Study	Unit of analysis	Channels	The focal inertial behavior	Main contributions
Bawa (1990)	Brand (cereal, facial tissue and paper towels)	Physical store	Modeling brand choice sequences to estimate inertia and variety-seeking tendencies	<ul style="list-style-type: none"> • Within-customer variability is captured as a hybrid of inertia and variety-seeking • More than half of the households exhibited hybrid behavior
Chintagunta (1998)	Brand (detergent and soft drinks)	Physical store	Estimation of inertia and variety seeking for purchasing timing and brand choice model	<ul style="list-style-type: none"> • State dependence in brand switching, which depends on purchase timing, was estimated • Insights into the optimal timing of brand promotions were provided
Dubé et al. (2010)	Brand (orange juice and margarine)	Physical store	Estimation of the effect of structural state dependence	<ul style="list-style-type: none"> • Inertia is evaluated through three potential economic explanations: loyalty, consumer search and learning
Chintagunta et al. (2012)	Shopping trip	Online and physical store	Product-specific purchase patterns across channel characteristics	<ul style="list-style-type: none"> • Transaction costs are quantified in a multichannel setting • Heavy and bulky items are often bought online, while perishables that require physical inspection are typically bought in stores
Pozzi (2012)	Brand (cereal)	Online and physical store	Evaluation of brand exploration across channels	<ul style="list-style-type: none"> • Brand exploration is more common in-store than online
Campo and Breugelmans (2015)	Shopping trip	Online and physical store	Category allocation across channels and the impact of online purchase experience	<ul style="list-style-type: none"> • Daily or regular items are more often purchased online than offline • As online purchase experience increases, the perceived risk of buying sensory categories online decreases, narrowing the gap in online category share
Melis et al. (2015)	Shopping trip	Online and physical store	The impact of past online purchase frequency and spending on online store choice	<ul style="list-style-type: none"> • With more online grocery experience, multichannel customers shift from comparing channels within a chain to comparing chains online
Melis et al. (2016)	Shopping trip	Online and physical store	The impact of online channel usage on the share of wallet for a retail chain, and the moderating effect of habitual purchase patterns	<ul style="list-style-type: none"> • The shift to multichannel shopping increases the share of wallet for the focal chain • This effect is stronger for time-constrained customers, distant shoppers and infrequent buyers for competing private labels or discounter products

(continued)

Table 1. Continued

Study	Unit of analysis	Channels	The focal inertial behavior	Main contributions
Koll and Plank (2022)	Brand (coffee, cola and shampoo)	Physical store	Evaluation of the stability of contextual cues influencing brand repurchasing	<ul style="list-style-type: none"> Stable contextual cues, such as using the same retailer, basket size, day of the week and private labels as in the previous shopping trip, promote brand repurchasing
Nakano (2023)	Shopping trip	Online and physical store	Demand concentration for popular products in a shopping basket between online and offline	<ul style="list-style-type: none"> Compared to physical store, online demand is more concentrated on popular products. As online shopping experience increases, the customer demand concentration becomes stronger
Chintala et al. (2024)	Shopping trip	Online and physical store	Variety and similarity in a shopping basket between online and offline	<ul style="list-style-type: none"> Diversity in online shopping baskets (measured by the number of categories and items) is significantly lower than in offline shopping Customer inertia is reinforced in the online grocery shopping environment
This study	Shopping trip	Online and physical store	Customer inertia measured by brand repurchasing share in a shopping basket. The decay of inertia during channel switching. The mitigating role of private labels	<ul style="list-style-type: none"> The brand repurchasing rate is higher for online channel continuation, compared to offline channel continuation The decay of inertia is stronger when customers switch channels For customers with a high share of private label purchases, the decay of inertia is mitigated

including smell, touch and sound are inaccessible online. Although functional information tends to have a stronger impact online, visual cues such as product packaging are generally less influential than in-store (Degeratu *et al.*, 2000). Consequently, cues such as price and brand name exert relatively greater influence in online settings. For these reasons, private labels appear to play an important role as contextual cues.

This perspective also relates to the literature on private label trust, perceived risk reduction and retailer relationships. Private labels may be perceived as lower in quality than national brands, leading to higher perceived risk (Konuk, 2020; Liljander *et al.*, 2009). However, as customers gain knowledge and purchase experience with private labels, their perceived quality increases, reducing perceived risk and building trust in private labels (Konuk, 2020). In addition, when customers already trust a retailer they frequently use, they may extend that trust to the retailer's private labels (Ailawadi *et al.*, 2008). Particularly in the grocery category, trust in private labels developed through these processes can make brand choices simpler and more efficient, thereby fostering inertial consumption behavior (Gielen and Steenkamp, 2019).

This study examines how customers' propensity to prefer private labels affects the relationship between brand repurchasing and channel switching. Specifically, it explores whether private labels can mitigate the anticipated decline in brand repurchasing during channel switching. The findings aim to inform retail marketing strategies to manage customer inertia.

Conceptual model and hypothesis development

This study explores how inertial behavior in brand repurchasing presents during consecutive shopping trips at a specific retailer – either when customers continue using the same channel or switch to a different one. The relationship between the channels used in shopping trips $t - 1$ and t is classified into four categories: consecutive use of the same channel (offline to offline or online to online) and channel switching (offline to online or online to offline). The focus here is on the relationship between shopping trips. A shopping trip refers to a single purchase occasion along with the associated shopping basket. In physical stores, it is defined as a visit to the store that results in a purchase, whereas in online settings, it refers to an order placed in a single shopping cart transaction. Note that studies using the shopping trip as the unit of analysis differ from those using brand purchasing as the unit, particularly in how variables are operationalized. In studies that focus on the brand purchasing unit, it is standard to assess whether a brand is selected on each product category purchase occasion. For instance, Koll and Plank (2022) modeled brand repurchasing in the categories of coffee, cola and shampoo based on each purchase occasion within the product category. However, while such an approach may capture changes in channel use at each product category purchase occasion, it does not allow for an analysis of sequential channel switching including all shopping trips, which is the main focus of this study. To address this limitation, this study draws inspiration from Chintala *et al.* (2024), who examined the composition ratio and variety of online and offline shopping baskets, and accordingly conceptualizes brand repurchasing by a composition ratio of the shopping basket. Specifically, although the detailed definition will be provided in a later section based on the data, the composition ratio refers to the proportion of brands in the shopping basket at trip t that were also included in the basket at trip $t - 1$ (i.e. the brand repurchasing rate). This variable is intended to capture the similarity or inertia between consecutive shopping baskets and used as the dependent variable in this study. Figure 1 presents the conceptual model of the relationship between channel switching and brand repurchasing.

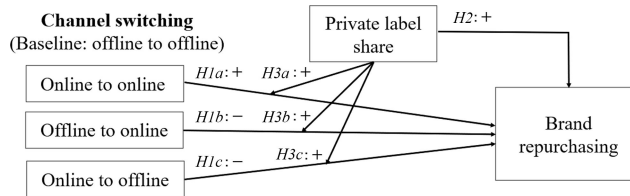


Figure 1. Conceptual model

The main effect is how the channel continuation or switching affects brand repurchasing. Because offline purchases have been a primary focus of previous research (e.g. Koll and Plank, 2022), and this pattern is the most frequently observed in the data, offline to offline transition is used as the baseline in this study. First, when comparing offline and online to online channel continuation, this study hypothesizes that the brand repurchasing rate will be higher for online to online continuation. The theoretical background of this hypothesis is the habit theory reviewed in the previous section, with a particular focus on the role of contextual cues and their stability (Wood *et al.*, 2002; Wood and Neal, 2009). The continuation from online to online is expected to involve more consistent contextual cues, leading to greater stability. This transition is also associated with a tendency to avoid uncertainty (Guo and Wang, 2024), lower propensity for brand exploration (Pozzi, 2012) and a shift toward more functional and routinized purchasing behavior (Campo and Breugelmans, 2015; Chintagunta *et al.*, 2012). Customers are more likely to rely on shortcuts based on past experiences, recommendations and purchase history, which tends to reduce the diversity of items in the shopping basket (Chintala *et al.*, 2024; Nakano, 2023). Using the offline to offline as the baseline, the following hypothesis is proposed:

H1a. The brand repurchasing rate is higher for online channel continuation, compared to offline channel continuation.

Compared with channel continuation, it is assumed that the brand repurchasing rate will decrease with channel switching, because contextual cues at the time of purchase become less stable (Wood and Neal, 2009). Although prior research has examined some contextual cues (Koll and Plank, 2022), the effect of disruptions to the channel as a context has not yet been discussed in detail. By advancing a new focus on channel stability, this study examines the role of the channel itself as a contextual cue in omnichannel settings. Therefore, the following hypotheses are posited:

H1b. The brand repurchasing rate is lower for offline to online channel switching, compared to offline channel continuation.

H1c. The brand repurchasing rate is lower for online to offline channel switching, compared to offline channels continuation.

Moreover, a unique perspective of this study is to examine which of the two switching directions (i.e. offline to online or online to offline) leads to higher brand repurchasing. The novelty lies in the asymmetry hypothesis. If such an asymmetry exists, it would be practically important for retailers to manage inertia differently depending on the switching pattern. In fact, online and physical store channels each have distinct strengths and weaknesses. In grocery shopping, readily usable information is more limited online than in physical stores (Degeratu *et al.*, 2000; Guo and Wang, 2024). Sensory information such as

smell, touch and sound cannot be used, and even visual information from product packaging is often more restricted (Alba *et al.*, 1997; Chintagunta *et al.*, 2012). Thus, online purchases involve more limited cues and are more functional in nature, with less room for exploration. These conditions could lead to the asymmetric effect across the two switching patterns. Specifically, when customers switch from offline to online, inertia is more likely to be reinforced. By contrast, switching from online to offline is expected to promote greater diversity in their choices. These channel-specific features lead to the expectation that customers tend to search for products in physical stores and then repurchase the same products online in subsequent purchases. Therefore, the following hypothesis is posited:

H1d. The brand repurchasing rate is higher for offline to online channel switching, compared to online to offline channel switching.

In addition, in grocery retailing, the online product assortment is generally smaller than the offline assortment because of challenges related to inventory management and delivery logistics (Campo *et al.*, 2021; Melis *et al.*, 2015). To confirm that the results of the hypotheses are not caused by differences in assortment, this study conducted robustness checks while controlling for assortment in line with Brynjolfsson *et al.* (2011) and Ratchford *et al.* (2023).

As a moderator that may strengthen the relationship between channel switching and brand repurchasing, this study focuses on the private label share in the customer's past purchases – that is, the proportion of private labels relative to national brands in their past purchases. Drawing on prior research on private labels (Ailawadi *et al.*, 2008; Koschate-Fischer *et al.*, 2014), the moderator variable, private label share, is operationalized as the proportion (on a monetary basis) of private label items among all items purchased from the focal retailer during the one-year period preceding shopping trip *t*. This variable reflects the customer's propensity toward private labels, based on their past purchasing experience. According to Koll and Plank (2022), private labels serve as contextual cues for brand repurchasing in physical stores. Based on this finding, the moderator may not only influence the relationship between the independent variable (channel switching) and the dependent variable (brand repurchasing), but also directly affect the dependent variable itself. Therefore, this variable qualifies as a quasi-moderator (Sharma *et al.*, 1981). For the offline to offline baseline, the following hypothesis is proposed:

H2. The customer's private label share (when offline channel continuation) is positively associated with the brand repurchasing rate.

Furthermore, regarding the relationship between channel switching and brand repurchasing, customers with a stronger preference for private labels are likely to experience more stable contextual cues. In grocery purchases, in which heuristic decision-making is common, private labels tend to serve as quality signals, which in turn fosters inertia (Gielens *et al.*, 2023; Verstraeten *et al.*, 2023; Volles *et al.*, 2023). In addition, from the perspective of trust in private labels, as customers gain more experience purchasing private labels, a mechanism of reduced perceived risk may accelerate simpler and more efficient brand choices (Gielens and Steenkamp, 2019; Konuk, 2020). Therefore, this moderator is expected to strengthen inertia between consecutive shopping trips. This effect is expected not only when customers keep using the same channel, where contextual stability is generally higher, but also when they switch channels. In other words, private labels are expected to play a mitigating role by reducing the weakening of inertia typically caused by channel switching. This phenomenon is hypothesized to apply to all channel transition patterns, therefore:

H3a-c. The brand repurchasing rate for (a) online channel continuation/(b) offline to online channel switching/(c) online to offline channel switching is higher when the customer's private label share is larger.

With regard to [Figure 1](#), further details are provided in the statistical methodology section. Although *H1d* is not depicted in [Figure 1](#), it is tested by comparing offline to online channel switching with online to offline channel switching.

Empirical analysis

Data description

The hypotheses are tested using large-scale purchase panel data (SCI data) provided by INTAGE Inc., a leading Japanese marketing research firm. SCI data are widely used in academic research (e.g. [Ishihara et al., 2023](#); [Nakano and Kondo, 2018](#)) and practical applications by brand marketers and retailers. The data include individual-level purchasing histories collected via home scan methods, where participants use electronic scanners to log all grocery transactions. This method reduces the burden of data collection by allowing easy scanning via smartphones or company-provided scanners. Furthermore, SCI data have been in operation for over a decade, and for newly registered panelists, data are only incorporated after confirming that they can consistently and accurately perform the scanning procedures, thereby ensuring data reliability. The panelists were sampled through quota sampling based on gender, age and residential area to represent the Japanese population. The data contain transaction details, including purchase date, stock keeping unit (SKU) name, price, purchasing channel (online or offline) and retailer, and panelist demographics, such as gender, age, family size and income. The analysis used data from three years (January 2019 to December 2021) as the estimation period and one year (January 2018 to December 2018) as the initialization period to operate the measures. As described later, this study calculates private label share based on past customer purchasing history data. In doing so, the initialization period is set as the training period, and this procedure follows [Campo and Breugelmans \(2015\)](#) and [Melis et al. \(2016\)](#). The samples that continuously participated in the panel during the entire observation period were used to avoid incomplete missing data.

The focal chains in this study are three of Japan's leading omnichannel supermarket chain retailers. These retailers operate both online and in brick-and-mortar stores. They integrate channels across various elements including information processing, fulfillment, marketing mix and backend systems. The retailers account for 84.2% of the sales of domestic online grocery retailers in the observation data of this study and can be considered representative chains in the Japanese market. The online share in terms of purchase amount was 13.0%, 15.1% and 15.9% for retailers A, B and C, respectively (from the full SCI data and not the analytical sample), indicating that these retailers are among the more advanced in adopting online grocery shopping in the Japanese market. For all of these retailers, online shopping involves a home delivery service, with products delivered directly to the customer's residence. The implementation of Click and Collect is limited to a few regional stores, with most services relying on home delivery. In such a grocery market, integrating online and offline channels poses greater challenges for retailers. This makes it a particularly suitable setting for examining customer inertia during channel switching and the role of moderators that may strengthen this relationship. For this study, the target sample consists of omnichannel customers, defined similarly as in [De Haan et al. \(2018\)](#), who studied customer device switching. The analysis included customers with at least two shopping trips with the retailer and at least one channel switch during the data period. Single-channel customers,

who did not switch channels, were excluded from the analysis. The data set comprises 4,071 unique customers, 310,776 total trips and 2,271,858 purchased items.

Table 2 provides descriptive statistics for each channel. Offline shopping trips were more frequent than online trips, reflecting that purchasing groceries in physical stores remains dominant. Compared to this difference, the difference in the total number of purchased items purchased across channels was relatively small, indicating higher per-visit purchasing volumes online. This bulk purchasing pattern is consistent with prior multichannel grocery studies (Chintagunta *et al.*, 2012; Chintala *et al.*, 2024). For groceries, this asymmetric assortment is often seen due to inventory management and delivery cost issues. Regarding retailers' share, Retailer A had the largest share, while Retailer C had the smallest. However, the composition ratios between online and offline of all three retailers were similar, thus store operation methods for online and physical stores were not significantly different among these three retailers. Private label share in the shopping basket per trip is 20.8% offline and 26.7% online. This ratio is generally consistent with previous research (e.g. Ailawadi *et al.*, 2008). When comparing the number of previous and current purchase pairs, the most common case was continuing offline, followed by continuing online. Switching from offline to online and online to offline occurred at similar rates.

Statistical methodology

The focal dependent variable is the brand repurchasing rate within shopping baskets (i.e. the ratio of the same brand in the basket), with its operational definition provided in **Table 3**. This variable represents the characteristics of each shopping trip for customers, following Chintala *et al.* (2024) who analyzed basket composition and variety. The ratio of the same brand (SKU level) is calculated as those purchased during the previous trip, out of the total number of items purchased. This metric evaluates the influence of prior purchases on the current shopping basket composition. Using this relative measure, rather than an absolute measure of repeated brands, eliminates differences in the total number of items purchased.

Before conducting the statistical model analysis, model-free evidence is examined. According to **Table 2**, the average brand repurchasing rate, in descending order, is as follows: Online_to_Online (0.226), Offline_to_Offline (0.089), Offline_to_Online (0.073) and Online_to_Offline (0.042). To check the relationship between the brand repurchasing rate and channel switching patterns, a one-way analysis of variance (ANOVA) was conducted.

Table 2. Summary statistics of shopping trips by channel

Variable	Offline	Online
Total trips	256,455	54,321
Total purchased items	1,884,019	1,013,622
No. of unique SKUs	199,643	110,150
<i>Share of trips by retailer, %</i>		
Retailer A	50.6	41.6
Retailer B	30.6	33.3
Retailer C	18.8	25.2
PL share, %	20.8	26.7
No. of trips (previous trip offline)	238,985	17,853
No. of trips (previous trip online)	17,470	36,468
<i>Average brand repurchasing rate in the shopping basket</i>		
Previous trip offline	0.089	0.073
Previous trip online	0.042	0.226

Table 3. Variable operationalization ($n = 310,776$ shopping trips)

Variable	Operationalization	M	SD
<i>DV</i>			
Brand repurchasing rate	The brand repurchasing rate in shopping trip t for customer i at retailer r . It is calculated as the number of items purchased in both trip $t - 1$ and trip t , divided by the total number of items purchased in trip t . It draws inspiration from Chintala et al. (2024) , who compare the composition of online and offline shopping baskets	0.102	0.195
<i>IV</i>			
Online to online	Purchased online in trip $t - 1$ and online in trip t (in consecutive trips for customer i at retailer r)	0.117	0.322
Offline to online	Purchased offline in trip $t - 1$ and online in trip t	0.057	0.233
Online to offline	Purchased online in trip $t - 1$ and offline in trip t	0.056	0.230
Offline to offline	Purchased offline in trip $t - 1$ and offline in trip t , used as the baseline	0.769	0.421
<i>Moderator</i>			
PL share	The expenditures (monetary base) for private labels at retailer r divided by the total expenditures at the retailer during the past year prior to the trip t . See Ailawadi et al. (2008) and Koschate-Fischer et al. (2014)	0.230	0.147
<i>Controls</i>			
Retailer FE	Dummy variables for retailers		
Nearby store count	The number of stores operated by the retailer in the customer's residential area (on a prefecture level)	35.697	30.527
Annual spending in initial period	Total purchase amount (in yen) at the retailer during the initialization period. Transformed using $\log(x)$	1.977	1.247
Gender	A dummy variable coded 1 for women	0.808	0.394
Age	Age of the customer at the year	45.346	11.827
Family size	Family size of the customer at the year	2.902	1.157
Income	Household income (in millions of yen) of the customer at the year	6.209	2.766
Year-quarter FE	Dummy variables for year and quarter		

The results show a significant difference in means across patterns ($F(3, 310772) = 6293, p < 0.01, \eta^2 = 0.06$). Post hoc multiple comparisons reveal that all pairwise differences are statistically significant ($p < 0.01$), and effect sizes using Cohen's d in descending order are as follows: Online_to_Online–Online_to_Offline ($d = -1.02$), Online_to_Online–Offline_to_Online ($d = -0.78$), Online_to_Online–Offline_to_Offline ($d = -0.70$), Online_to_Offline–Offline_to_Offline ($d = 0.25$), Offline_to_Online–Online_to_Offline ($d = -0.23$) and Offline_to_Online–Offline_to_Offline ($d = 0.09$).

Although model-free evidence is presented, the data in this study are observational, and the analysis cannot control for customer heterogeneity and self-selection bias. Therefore, simple comparisons are not appropriate. To address these issues, this study uses a weighted regression model using propensity scores, as described below. The outcome variable, which is the brand repurchasing rate for customer i at retailer r in shopping trip t , is restricted between zero and one. Because this variable does not follow a normal distribution, the log-centering transformation is adopted to linearize the model (Campo and Breugelmans, 2015; Cleeren et al., 2013; Koschate-Fischer et al., 2014). To avoid y_{irt} equaling zero (the log of zero) when $RepurchasingRate_{irt}$ is one or zero, a small value (0.001) is added to the numerator and denominator (cf. Bass et al., 2007; Campo and Breugelmans, 2015; Cleeren et al., 2013):

$$y_{irt} = \ln \left(\frac{RepurchasingRate_{irt} + 0.001}{1 - RepurchasingRate_{irt} + 0.001} \right) \quad (1)$$

The focal independent variables are channel switching dummies, the private label share in accumulated past purchases and the interaction terms. The equation of the model is as follows:

$$\begin{aligned} y_{irt} = & \alpha_i + \beta_1 Online_to_Online_{irt} + \beta_2 Offline_to_Online_{irt} + \beta_3 Online_to_Offline_{irt} \\ & + \gamma_1 PLshare_{irt} + \omega_1 Online_to_Online_{irt} \times PLshare_{irt} + \omega_2 Offline_to_Online_{irt} \\ & \times PLshare_{irt} + \omega_5 Online_to_Offline_{irt} \times PLshare_{irt} + \varphi_k W_{irt} + \varepsilon_{irt} \end{aligned} \quad (2)$$

where $Online_to_Online_{irt}$ is a dummy variable indicating that if customer i continues using the online channel at purchasing time t after using the online channel at purchasing time $t - 1$ for retailer r , the value is 1; otherwise, 0. Similarly, $Offline_to_Online_{irt}$ represents a dummy variable for switching from offline to online, and $Online_to_Offline_{irt}$ represents switching from online to offline. The base category is when the customer remains in the offline state (offline to offline). $PLshare_{irt}$ denotes the expenditures (in monetary base) for private labels at retailer r divided by the total expenditures at the retailer during the past year prior to the purchasing time t , with reference to Ailawadi et al. (2008) and Koschate-Fischer et al. (2014). The private label share variable is standardized in the analysis. To consider individual-level customer heterogeneity, a random intercept α_i is adopted. α_i is defined as $\alpha_i = \bar{\alpha} + v_i$, where $\bar{\alpha}$ is a constant term and v_i is a random effect term, with mean 0 and individual-level variance σ_v^2 . To consider multiple observations per customer, the model incorporates intra-individual correlation within its structure. Estimation was conducted using R's lme4 package (Bates et al., 2015).

W_{irt} is a vector of control variables including retailer fixed effects, year-quarter fixed effects, nearby store count, annual spending in the initial period and demographics (gender, age, family size and income). As noted later, to improve estimation robustness, this study follows the approach of De Haan et al. (2018) and also includes control variables in the

model. These controls are consistent with [Koll and Plank \(2022\)](#), where age, family size and annual spending are expected to have positive effects, while income is expected to have a negative effect. In addition, nearby store count is expected to be positive, as nearby stores tend to increase purchase frequency ([Koll and Plank, 2022](#)), and gender (women = 1) is expected to be negative, due to exploratory tendencies toward unknown brands ([Karpinska-Kraskowiak, 2021](#)).

[Table 3](#) provides the details of its operationalization and [Table 4](#) presents the correlation matrix. To check for multicollinearity, the variance inflation factors (VIF) in the proposed model are calculated. The maximum VIF value is 1.41, well below 10 as the criterion, confirming that there is no multicollinearity issue.

A customer's channel choice is affected by their preferences and context, resulting in self-selection bias. To capture the impact of channel switching to brand repurchasing accurately, this bias must be controlled and channel switching must be made comparable. To address this issue, a propensity scores analysis is conducted; this method is widely used in multi and omnichannel research ([Ma, 2016](#); [Montaguti et al., 2016](#); [Zhang et al., 2022](#)). As the setting of this study is similar to [De Haan et al. \(2018\)](#), which investigated the relationship between device switching and conversion rates, I refer to their procedure. Four channel switching patterns are assumed: (1) continuing offline, (2) continuing online, (3) switching from offline to online, and (4) switching from online to offline.

In the propensity score analysis, the treatment variable is generally binary, but this study involves multiple treatments. Therefore, a generalized propensity score approach ([Imbens, 2000](#)) was applied to accommodate multiple treatments. Propensity scores were estimated using a multinomial logistic regression model with random effects as shown in [equation \(3\)](#). The dependent variable is channel switching. Because the pattern of offline to offline has the largest proportion, it is set as the reference group. To control for individual heterogeneity, random effects are included. The probability predicted by this model is the propensity score:

$$Uswitch_{it} = \zeta_i + \theta_1 Retailer_FE + \theta_2 Nearby_store_count_{it} + \theta_3 Annual_spending_{it} \\ + \theta_4 PLshare_{it} + \theta_5 Gender_{it} + \theta_6 Age_{it} + \theta_7 Family_size_{it} + \theta_8 Income_{it} + \epsilon_{it} \quad (3)$$

The covariates in the model are grounded in the literature on customer channel choice and consistent with the control variables in [equation \(2\)](#) (see [Table 3](#) for operational details). Regarding the choice between online and offline shopping, the variable frequently adopted in previous studies is the distance from a customer's residence to the store. If this distance is short, customers are more likely to choose offline shopping; otherwise, online shopping becomes more likely, thereby motivating channel switching ([Chintagunta et al., 2012](#); [Melis et al., 2016](#)). In some cases, as a proxy exogenous variable for distance, the number of stores near the customer's residence is often used. This study adapts the nearby store count, referencing [Ratchford et al. \(2023\)](#) and [Zentner et al. \(2013\)](#). This covariate is measured as time-dependent at the year level and reflects the store opening situation at the year point. In addition, customers who frequently shop at a supermarket chain have more opportunities to use multiple channels, which increases the likelihood of channel switching ([Thomas and Sullivan, 2005](#)). Following [Ma \(2016\)](#), which includes the number of past orders in propensity score estimation in a multichannel retailing study, a covariate is added for the purchase amount in the initialization period. This covariate reflects whether customers are heavy or light users. Finally, the analyses include the demographics often used in channel studies ([Chintagunta et al., 2012](#); [De Haan et al., 2018](#); [Chintagunta et al., 2012](#)), private label share and retailer fixed effects.

Table 4. Correlation matrix ($n = 310,776$ shopping trips)

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Brand repurchasing rate	1.000	0.232	-0.036	-0.075	-0.116	0.075	0.010	-0.036	-0.133	0.031	-0.050	-0.022
2. Online to online	0.232	1.000	-0.089	-0.090	-0.665	0.111	-0.012	-0.100	-0.004	-0.031	0.008	-0.020
3. Offline to online	-0.036	-0.089	1.000	-0.060	-0.445	0.013	0.002	-0.015	0.014	-0.018	0.024	0.002
4. Online to offline	-0.075	-0.090	-0.060	1.000	-0.450	-0.002	0.003	-0.025	0.014	-0.021	0.022	0.002
5. Offline to offline	-0.116	-0.665	-0.445	-0.450	1.000	-0.090	0.006	0.098	-0.012	0.045	-0.032	0.013
6. PL share	0.075	0.111	0.013	-0.002	-0.090	1.000	-0.051	-0.124	0.020	-0.047	-0.002	-0.071
7. Nearby store count	0.010	-0.012	0.002	0.003	0.006	-0.051	1.000	0.037	-0.029	0.011	-0.073	0.000
8. Annual spending in initial period	-0.036	-0.100	-0.015	-0.025	0.098	-0.124	0.037	1.000	0.045	0.293	0.051	0.045
9. Gender	-0.133	-0.004	0.014	0.014	-0.012	0.020	-0.029	0.045	1.000	-0.036	0.188	0.047
10. Age	0.031	-0.031	-0.018	-0.021	0.045	-0.047	0.011	0.293	-0.036	1.000	-0.223	-0.016
11. Family size	-0.050	0.008	0.024	0.022	-0.032	-0.002	-0.073	0.051	0.188	-0.223	1.000	0.285
12. Income	-0.022	-0.020	0.002	0.002	0.013	-0.071	0.000	0.045	0.047	-0.016	0.285	1.000

In the analysis, a consistent approach was applied following the procedures of [De Haan et al. \(2018\)](#) and [Austin \(2011\)](#). After checking the covariate balance, two models were estimated. The first model does not use propensity scores and corresponds to the model in [equation \(2\)](#). The second is a weighted regression model using inverse probability weighting (IPW), a method of weighting by the inverse of the propensity score. Because this study's interest is in both the treatment effect and the moderation effect, a weighted regression approach was adopted.

Results

With regard to the estimation of the generalized propensity score, [Table 5](#) shows the parameter estimates for the multinomial logit model in [equation \(3\)](#). All parameters of covariates are significant in either channel continuation or switching, indicating the presence of bias in the original data. The nearby store count positively affects channel switching; that is, customers are more likely to switch channels when there are more nearby stores. The purchase amount has negative effects on all patterns, suggesting that customers who spend more are more likely to continue offline. The private label share coefficient is highest for online to online channel continuation. Regarding demographics, women and younger customers are more likely to switch channels. In addition, larger family sizes and lower income levels are associated with a greater likelihood of actions other than continuing offline.

To check for covariate balance, the standardized bias (SB) was calculated for all covariates using the estimated propensity scores ([Austin, 2019](#); [Caliendo and Kopeinig, 2008](#)). If the SB value is below 0.05, the distribution of the covariate is considered balanced. In this study, all covariates meet this criterion. Additional details on the validation check are provided in [Appendix 1](#).

[Table 6](#) shows the parameter estimates of the main model used to test the hypotheses. It includes the estimates for (1) before correction (i.e. the model without propensity score analysis) and (2) the weighted propensity score correction (i.e. the weighted regression model using IPW). Including covariates alongside propensity score weighting could improve estimation robustness ([De Haan et al., 2018](#); [Austin, 2011](#)); thus, control variables are included in the proposed model. To check whether the results change, a model without controls is also estimated. In [Table 6](#), the constant means the estimate of the constant term $\bar{\alpha}$, which represents the baseline (offline to offline). The signs and significance of all parameters

Table 5. Parameter estimates for the generalized propensity score model

Parameter	Online to online		Offline to online		Online to offline	
	Coef.	Std. err.	Coef.	Std. err.	Coef.	Std. err.
Constant	-1.865	0.034**	-2.784	0.047**	-2.656	0.046**
Retailer B	0.399	0.014**	0.187	0.019**	0.188	0.018**
Retailer C	0.715	0.015**	0.196	0.021**	0.158	0.021**
Nearby store count	0.000	0.000	0.001	0.000*	0.001	0.000*
Annual spending in initial period	-0.224	0.005**	-0.073	0.007**	-0.112	0.007**
PL share	0.300	0.005**	0.101	0.008**	0.036	0.008**
Gender	0.002	0.015	0.128	0.021**	0.143	0.021**
Age	0.000	0.001	-0.003	0.001**	-0.004	0.001**
Family size	0.073	0.005**	0.103	0.007**	0.094	0.007**
Income	-0.025	0.002**	-0.010	0.003**	-0.010	0.003**

Note(s): ** $p < 0.01$, * $p < 0.05$

Table 6. Parameter estimates for the main model

Parameter	Before correction		Weighted PS Correction without controls		Weighted PS Correction	
	Coef.	Std. err.	Coef.	Std. err.	Coef.	Std. err.
Constant	-5.415	0.100**	-4.999	0.025**	-5.258	0.100**
Online to online	2.365	0.025**	2.349	0.019**	2.325	0.019**
Offline to online	-0.341	0.023**	-0.412	0.016**	-0.421	0.016**
Online to offline	-0.566	0.023**	-0.643	0.016**	-0.651	0.016**
PL share	0.145	0.010**	0.112	0.013**	0.115	0.013**
Online to online × PL share	0.122	0.019**	0.061	0.017**	0.058	0.017**
Offline to online × PL share	0.134	0.021**	0.143	0.014**	0.136	0.014**
Online to offline × PL share	0.095	0.021**	0.091	0.014**	0.083	0.014**
Control variables						
Retailer FE	Yes		No		Yes	
Nearby store count	Yes		No		Yes	
Annual spending in initial period	Yes		No		Yes	
Gender	Yes		No		Yes	
Age	Yes		No		Yes	
Family size	Yes		No		Yes	
Income	Yes		No		Yes	
Year-quarter FE	Yes		No		Yes	

Note(s): ** $p < 0.01$, * $p < 0.05$; PS denotes propensity score

are consistent between these models. Thus, the results of the weighted propensity score correction model with controls are the focus for interpretation.

Main effect

Regarding *H1a*, the online to online parameter is positive and significant ($\hat{\beta}_1 = 2.325$, $p < 0.01$). Because the coefficient is positive, this indicates that when customers continue to use online channels, their brand repurchasing rate is higher than when they continue to use offline channels. Therefore, *H1a* is supported. Conversely, the brand repurchasing rate decreases when customers switch channels, as opposed to when they continue using the same channel. For *H1b*, the offline to online parameter is significantly negative ($\hat{\beta}_2 = -0.421$, $p < 0.01$), indicating that when moving from offline to online shopping, the brand repurchasing rate is lower. Thus, *H1b* is supported. Similarly, the online to offline parameter is significantly negative ($\hat{\beta}_3 = -0.651$, $p < 0.01$), which indicates that when moving from online to offline, the brand repurchasing rate is lower, supporting *H1c*. While the parameters for channel switching are negative for both offline to online ($\hat{\beta}_2$) and online to offline ($\hat{\beta}_3$), the estimated parameter is larger in the offline to online case ($\Delta = 0.230$, $p < 0.01$). This suggests that transitioning from a physical to online store increased the likelihood of a customer repurchasing the same brands within their shopping baskets. The similarity between shopping baskets increases, reflecting a stronger consistency in customer choices.

Moderating effect

Before interpreting the moderating effect, the impact of the moderator on the dependent variable is reviewed, as stated in *H2*. This corresponds with confirming the effect of private label share under the baseline condition of offline channel continuation. The coefficient for the baseline private label share is positive and significant ($\hat{\gamma}_1 = 0.115$, $p < 0.01$). This supports *H2* that when offline purchasing is continued, the brand repurchasing rate is higher when customer's private label share is larger.

Regarding the moderating effect for online channel continuation, the effect of the estimate of the interaction term is added to the baseline parameter ($\hat{\gamma}_1$). The online to online parameter is positive and significant ($\hat{\omega}_1 = 0.058$, $p < 0.01$), showing that the brand repurchasing rate increases with a higher private label share. Thus, *H3a* is supported. Positive moderating effects are also observed for channel switching. The offline to online parameter is positive and significant ($\hat{\omega}_2 = 0.136$, $p < 0.01$), supporting *H3b*. Similarly, the online to offline parameter is also positive and significant ($\hat{\omega}_3 = 0.083$, $p < 0.01$). Thus, *H3c* is supported. In addition, the offline to online parameter is larger than the online to offline parameter ($\Delta = 0.053$, $p < 0.01$). Therefore, the moderating effect of private labels is stronger for offline to online channel switching.

Robustness checks

As the results may be influenced by differences in product assortment between the online and offline channels of the retailers, this study re-analyzed the data restricting the SKUs confirmed to be available both online and offline by each retailer. This approach follows Brynjolfsson *et al.* (2011) and Ratchford *et al.* (2023), who restricted their samples to common products available in both channels and conducted robustness checks. Appendix 2 shows that controlling for assortments did not change the sign and significance of the coefficients for any parameters. Therefore, it can be concluded that differences in product assortments do not affect the main effects and moderating effects observed in this study.

In addition, a robustness check was performed to evaluate the setting of the analysis period for this study. The analysis period spanned from January 2019 to December 2021.

However, it is possible that customer behavior in using channels changed due to the COVID-19 pandemic, particularly in 2020. To address this concern, the model was re-estimated using data from January 2019 to December 2019, before the pandemic. As shown in [Appendix 2](#), the signs and significance of the coefficients remain unchanged compared to the original model. Therefore, the pandemic did not affect the study results.

The first case of COVID-19 in Japan was confirmed on January 16, 2020, with the number of infections increasing thereafter ([Ministry of Health, Labour and Welfare, 2023](#)). While the Japanese government issued states of emergency to encourage citizens to stay home, no mandatory lockdowns were implemented and supermarkets generally remained operational. The most notable impact on the grocery retail market occurred around the first state of emergency in early April 2020; however, according to [Konishi et al. \(2024\)](#), supermarket food sales for that month rose by no more than 16.5% compared to the same month in 2019 due to temporary stockpiling demand. Subsequent increases in grocery sales were relatively limited ([Konishi et al., 2024](#)). This implies that supermarkets continued their normal operations throughout the pandemic and that customers maintained relatively stable purchasing patterns due to the essential nature of groceries. Consequently, these may contribute to the robustness of the findings in this study.

Discussion and implications

This study investigated the influence of channel switching on a customer's brand repurchasing in omnichannel grocery retailing. Previous studies have focused on brand repurchasing within a single channel ([Bawa, 1990](#); [Chintagunta, 1998](#); [Dubé et al., 2010](#); [Koll and Plank, 2022](#)) or on the influence of customer inertia in multichannel shopping settings ([Campo and Breugelmans, 2015](#); [Chintagunta et al., 2012](#); [Chintala et al., 2024](#); [Melis et al., 2015, 2016](#); [Nakano, 2023](#); [Pozzi, 2012](#)). In contrast, this study sheds new light on brand repurchasing behavior during channel switching. By doing so, it offers novel insights into grocery shopping, including the stronger impact of customer inertia in online compared to offline settings, the decay of inertia when customers switch channels and the mitigating role of private labels in this process. These findings contribute to both academic research and managerial practice.

Theoretical implications

The finding that inertial brand repurchasing tendencies are stronger in online than in offline extends the literature on inertial customer behavior ([Bawa, 1990](#); [Chintagunta, 1998](#); [Dubé et al., 2010](#); [Henderson et al., 2021](#); [Hoyer, 1984](#)) to the context of omnichannel retailing. This result also broadens the applicability of habit theory ([Wood et al., 2002](#); [Wood and Neal, 2009](#)). In in-store purchase decision-making, when contextual cues are stable, customer inertia tends to strengthen ([Koll and Plank, 2022](#)). From the perspective of contextual cue stability, online shopping offers fewer cues (such as sensory information) than physical stores, leading customers to rely on more limited information when making decisions. Moreover, the influence of recommendation systems and shortcuts to past purchases further reduces exploration. Consequently, online grocery shopping is less exploratory ([Pozzi, 2012](#)), baskets are less diverse ([Chintala et al., 2024](#); [Nakano, 2023](#)) and customers are more inclined to avoid uncertainty ([Guo and Wang, 2024](#)). This study captures customer inertia in shopping baskets in terms of brand repurchasing, offering empirical evidence of such inertial tendencies in the online environment. This finding also contributes to the literature on shopping baskets composed of both online and offline purchases ([Campo and Breugelmans, 2015](#); [Campo et al., 2021](#); [Chintala et al., 2024](#); [Degeratu et al., 2000](#); [Melis et al., 2015](#); [Melis et al., 2016](#); [Nakano, 2023](#)).

Furthermore, this study finds that customer inertia weakens when switching channels, compared with when continuing within the same channel. From the perspective of contextual cues, this suggests that changing channels destabilizes those cues, resulting in a decay of inertia (Henderson *et al.*, 2021; Wood and Neal, 2009). Notably, an asymmetric effect is observed across switching patterns. Switching from offline to online channels is more likely to lead to brand repurchasing than switching from online to offline channels. This suggests that physical stores serve as important places for exploration, enabling customers to discover products (Grewal *et al.*, 2023; Pozzi, 2012). The tendency of exploration and variety seeking in physical store environments leads to a greater reduction in inertia when customers switch from online to offline. Recently, there has been growing interest in re-examining the role of physical stores, especially after the COVID-19 pandemic. Researchers have suggested that physical stores provide opportunities for trialability (Roggeveen *et al.*, 2020) and discovery (Breugelmans *et al.*, 2023) in customer–brand relationships. This has implications for the future role of physical stores, especially in an era of rapid digitalization (Grewal *et al.*, 2023).

To mitigate the decay of customer inertia during channel switching, this study examined the moderating effect of the private label share in a customer’s past purchase history. The finding extends the literature on private label purchasing in online shopping environments (Verstraeten *et al.*, 2023; Volles *et al.*, 2023). It also highlights the role of private labels as quality signals in omnichannel retail settings (Gielens *et al.*, 2021). This signaling effect becomes particularly influential in situations where purchasing cues are limited, such as in online environments, thereby reinforcing customer inertia. In addition, even when inertia tends to decay during channel switching, the stable context of purchasing private labels restores a sense of consistency, resulting in greater homogeneity in the shopping basket. These arguments extend the work of Koll and Plank (2022), who demonstrated that private label purchasing in physical stores serves as a strong contextual cue that promotes brand repurchasing. Connecting this finding to research on private label trust and perceived risk reduction (Konuk, 2020; Liljander *et al.*, 2009), retailers enhance their ability to maintain customer inertia during channel switching by building trusted private-label brands. This perspective can further be applied to the literature on brand–retailer relationships (Ailawadi *et al.*, 2008; Hoskins *et al.*, 2024; Koschate-Fischer *et al.*, 2014). The current findings suggest that retailers can influence customers’ habitual purchasing behaviors by managing the share of private labels in their shopping baskets.

Managerial implications

This study addresses a contemporary management issue concerning how to manage customer inertia in online environments and, more broadly, within the context of omnichannel retailing. In the sense that brand repurchasing brings sustained profitability to retailers, customer inertia is a desirable outcome (Gupta and Zeithaml, 2006). However, without genuine attachment to the brand, this inertia can easily be disrupted in competitive markets (Moe and Yang, 2009; Watson *et al.*, 2015). Although building brand loyalty accompanied by customer positive attitudes is essential for manufacturers, not all products – particularly those in categories such as groceries that are dominated by routinized habits – are capable of developing such loyalty (Henderson *et al.*, 2021; Siebert *et al.*, 2020). From the perspective of grocery retailers, understanding customer habits is valuable for both the pursuit of profit efficiency and customer relationship management.

In recent years, retailers have increasingly shifted their focus to online channels, and growing attention has been paid to how customer inertia and variety-seeking behavior operate across online and offline settings (Chintala *et al.*, 2024; Nakano, 2023). The study findings offer practical implications for how both channels should be positioned within

future omnichannel retailing strategies. As long as customers use online shopping primarily for convenience and time savings (Chintagunta *et al.*, 2012; Melis *et al.*, 2016), it may be undesirable to disrupt the strong inertia that supports their continued purchasing behavior. Rather, to strengthen customer inertia, the recommendations on the top page of the e-commerce site and within the shopping cart would be better structured.

At the same time, it is also important to redesign physical stores as central hubs for engaging customer experiences (Breugelmans *et al.*, 2023; Grewal *et al.*, 2023). To achieve this, retailers need to provide experiences unavailable online, such as sensory merchandising, tasting and sampling events and meaningful interactions with store staff. From a near-future technological perspective, such experiences may also include augmented and mixed reality-based immersive entertainment, in-store personalization supported by smart carts and motion-sensing technologies, and the activation of social and community elements through in-store restaurants (Grewal *et al.*, 2023; Scholdra *et al.*, 2023). These environments allow customers to encounter brands and experiences they did not intend to engage with before visiting the store, thereby fostering serendipitous discovery (Kim *et al.*, 2021). While seamless omnichannel integration has been widely emphasized, strategic inconsistency generated by the inherent heterogeneity between online and offline channels can sometimes play a constructive role (Gasparin *et al.*, 2022). Such unanticipated encounters evoke surprise and anticipation, strengthening positive customer experiences. These stores move beyond mere routine grocery shopping and instead offer customers opportunities for excitement and discovery through exposure to new products. From the perspective of customer journey, retailers should aim to build stronger relationships with customers, not by relying on a passive loyalty loop but by providing moderate stimulation throughout the experience (Siebert *et al.*, 2020). In particular, the moment customers switch channels from online to offline is likely to trigger exploration. Retailers are therefore expected to develop customer journey strategies that effectively leverage this critical transition.

Retailers should also recognize the role of private labels as contextual cues in reducing inertia decay. A key challenge in brand strategy within digital environments is that weaker brands tend to receive limited visibility on e-commerce platforms, causing demand to concentrate disproportionately on stronger brands (Chintala *et al.*, 2024; Gielens *et al.*, 2021; Nakano, 2023). In such situations, cultivating trust in private labels enables retailers to manage customer inertia more effectively. In particular, when inertia decays during the transition from online to offline channels, this moment provides customers with opportunities for brand discovery but also creates a risk of defection from previously purchased brands. Private labels can mitigate this risk by stabilizing contextual cues and promoting greater homogeneity in the shopping basket. This perspective is relevant not only for fully integrated omnichannel retailers but also for retailers whose sales are predominantly online and who aim to strengthen their private-label portfolios. By effectively leveraging private labels, online retailers can reinforce customer inertia and maintain the loyalty loop in digital environments.

This study analyzes data from Japanese omnichannel grocery retailers, but its findings offer implications for similar markets in other countries. While the penetration of private labels is more advanced in Europe than in the USA, there is still room for growth in Japan and other emerging markets (Gielens *et al.*, 2023). It should be noted that the retailers examined in this study operate some of the largest chains in Japan, with private label shares in their grocery businesses being relatively close to the average in the US market as of 2021 (PLMA Report, 2025). As online retailing continues to expand globally, a key challenge for retailers will be the positioning of their private

labels across both online and offline channels. From the perspective of reducing inertia decay, it is advisable for retailers to leverage private labels as contextual cues that support customer continuity when they switch between channels. Channel integration in omnichannel retailing can be classified into several levels: minimal integration (e.g. marketing communications), moderate integration (e.g. fulfillment and information access) and full integration (e.g. marketing mix, backend systems and organizational structure) (Cao and Li, 2015). Marketing mix integration in grocery retailing typically shows an asymmetric pattern, with broader assortments available in physical stores and higher prices often found online (Campo and Breugelmans, 2015). Given these conditions, a strategy of moderate integration is more realistic, and retailers can control customer inertia by effectively integrating information access and leveraging private label strategies. One possible approach is to promote private labels through personalized recommendations when customers shift from offline to online channels using integrated purchase histories across both channels. Such a strategy offers wide applicability as digitalization and the adoption of private labels continues to expand globally.

Limitations and future research

This study has several limitations. First, this study only captures brand repurchasing based on the ratio in the shopping baskets as the unit of analysis. Because the study's interest lies in continuous shopping trips and channel switching in omnichannel grocery retailing. For this purpose, analyzing data by the unit of shopping trip offers valuable insights. However, it is also possible to analyze the data from the perspective of category shopping opportunities as a unit of analysis. In that case, brand repurchasing could be captured for each category purchase opportunity, which is the natural unit for understanding customer behavior at the brand level. However, this approach does not support tracking channel switching across consecutive shopping trips. This limitation occurs because products from a specific category are not consistently purchased in both shopping trips at t and $t + 1$. Future research should focus on the brand-level analysis based on specific category purchase timing to provide more detailed category-specific insights.

Second, further refinement regarding basket size and contents would be valuable. A large purchase with few repeated items may result in a lower repurchase rate under the current metric. Moreover, the metric does not differentiate between routine essentials and more deliberative purchases. Addressing these issues would deepen understanding of customers' habitual purchasing behavior.

Third, further research should test the findings in other countries. The inertia decay effect when channel switching, driven by the stability of contextual cues, is expected to extend to other countries. Likewise, the moderating role of private labels could also apply, given that the level of private-label development in Japan is relatively comparable to that of the USA and many other countries (Gielens *et al.*, 2023; PLMA Report, 2025). However, in markets where private labels are more mature or less developed, the magnitude of these effects may differ. Exploring such cross-market heterogeneity represents a direction for future research.

Finally, this study examined the relationship between channel switching based on a combination of two shopping trips and, therefore, does not capture longitudinal changes in brand repurchasing. Adopting an approach that accumulates these state transitions, such as a Markov switching matrix, could enable the analysis of longitudinal changes. Capturing these changes could contribute to the development of long-term product recommendation strategies for retailers and manufacturers.

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Appendix 1. Propensity score validation

Standardized bias (SB) is an indicator that confirms whether the values weighted by the propensity score for the covariates X_k of the treatment (online to online, offline to online and online to offline) and control groups (offline to offline) are comparable (Austin, 2011; Caliendo and Kopeinig, 2008). The calculation of SB is as follows:

$$SB = \frac{\bar{X}_T - \bar{X}_C}{\sqrt{\frac{V_T(X_k) + V_C(X_k)}{2}}}$$

where \bar{X}_T and \bar{X}_C are the means and $V_T(X_k)$ and $V_C(X_k)$ are the variances of covariate X_k . In empirical studies, an SB below 5% is deemed as sufficient (Caliendo and Kopeinig, 2008). Table A1 presents the SB scores of this study.

Table A1. Standardized bias scores

Variable	Online to online	Offline to online	Online to offline
Nearby store count	0.003	-0.011	-0.009
Retailer B	0.006	0.002	0.002
Retailer C	-0.004	0.006	0.007
Annual spending in initial period	0.017	-0.007	-0.011
PL share	0.004	0.008	-0.009
Gender	0.015	0.003	0.004
Age	-0.009	-0.002	0.000
Family size	0.013	-0.002	-0.002
Income	-0.017	0.006	0.008

Table A2. Parameter estimates for robustness checks

Parameter	(1) Controlling for assortment		(2) Time period (before COVID-19 pandemic)	
	Coef.	Std. err.	Coef.	Std. err.
Constant	-5.163	0.103**	-5.454	0.148**
Online to online	2.248	0.019**	2.281	0.033**
Offline to online	-0.439	0.016**	-0.377	0.028**
Online to offline	-0.687	0.016**	-0.604	0.028**
PL share	0.126	0.013**	0.155	0.023**
Online to online × PL share	0.052	0.017**	0.084	0.030**
Offline to online × PL share	0.139	0.015**	0.124	0.026**
Online to offline × PL share	0.087	0.015**	0.064	0.026*
Control variables				
Retailer FE	Yes		Yes	
Nearby store count	Yes		Yes	
Annual spending in initial period	Yes		Yes	
Gender	Yes		Yes	
Age	Yes		Yes	
Family size	Yes		Yes	
Income	Yes		Yes	
Year-quarter FE	Yes		Yes	
Observations	299,895		107,403	

Note(s): ** $p < 0.01$, * $p < 0.05$

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