The Marketing Firm: Retailer and consumer contingencies

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Abstract

Efficiency has emerged as an important consumer value and thus has increased the importance of the in-store search as one facet of consumer transaction costs. This paper contributes to the development of a marketing theory of the firm by analyzing the consumers' in-store efficiency ratios and the retailers' natural sources of resistance to offer efficiency to all of their customers. We propose new behavioral metrics for consumer transaction costs. Our data from the behavioral tracking of 497 complete shopping trips reveal more transaction costs for quick shopping trips than for regular shopping trips, which demonstrates friction between retail and consumer transaction costs for quick trips.

Keywords: transaction costs, efficiency, market orientation, contingencies, in-store behavior

"A fractionally lower price gets the business. That is seldom true except in the imagined world of economics textbooks." (Levitt, 1980, p. 84)

1.0 Introduction

Although price is an important factor in the marketing mix (the combination of marketing actions that create a profitable firm) as it is the only one that directly creates revenue, the challenge is that the competition can more easily respond to price tactics than most other promotions. This is evident in Norwegian grocery retailing, which demonstrates only marginal differences in pricing within retail segments as well as across segments. For instance, measurements of basket values across retail chains conducted regularly and independently (VG.no, 2019) for the period 2016-2018 (comprising eight studies) show that the average difference in the discount segment was only 1.5% (between the highest and the lowest basket value). As a consequence, consumers have increased their value on time and effort in low involvement shopping situations (Davis and Hodges, 2012; Nielsen, 2014). These are currencies involved in a transaction (Sorensen, 2016), representing the transaction cost for the consumer, in addition to the prices paid. Online retailers have gained greatly from this development, and physical stores have been advised to offer greater store convenience as a combative strategy to remain competitive against online retailers. (Reimers, 2014). Shopping efficiency from the customer's perspective is therefore more important now than previously as a functional outcome in physical retailing.

1.1 Should the size of the physical retailer depend on the cost of using the Internet?

Food retailers are responding to customer churn and the move to e-grocery and "grab and go" stores by introducing smaller store concepts and trying to make the store more attractive for time-pressured consumers, as this segment is increasing (Feld, 2019). The reasons why

consumers feel increasingly time constrained include, among others, more dual income households, longer working hours, and a more blurred line between work and leisure time due to the adoption of technology such as smart phones (see, e.g., Reimers and Clulow, 2009; Reimers, 2014). As with other transaction costs, as consumer time and effort decrease, the economy becomes more efficient as consumers are freed to produce wealth. However, the consumer demand for lower transaction costs does not come without growing pains, as retailers must adjust to the new environmental contingencies. Walmart, for instance, began to aggressively expand their Neighborhood Market concept in 2012-2013 (Bowman, 2016). The size of these stores represents only a fifth of the size of Walmart supercenters (Walmart.com, 2018), and there are now more than 800 Neighborhood Market stores in the United States (Statista, 2018). Walmart describes the Neighborhood Market concept as a smaller-footprint option for communities (Walmart.com, 2018). This smaller store concept has easy access to products, and is therefore more convenient for the customer to shop and is supposed to save time and energy. Another example of new physical store concepts can be seen with Aldi's aggressive expansion in the United States. Aldi has long been a champion of the small-format discount store. With their focus on private brands and in-store efficiency, Aldi is on track to be the third largest grocery retailer by 2022, behind Walmart and Kroger (Tyler, 2018). Retailers in the United Kingdom have also demonstrated a commitment towards smaller and more convenient store concepts. For instance, smaller convenience stores are one of the two large growth areas for Co-op in the United Kingdom (Steiner, 2018). There has been a wave of re-entry into city centers based on new smaller formats such as Tesco's Metro and Tesco Express (Reynolds, Howard, Cuthbertson & Hristov, 2007). Food retailers are trying to make the shopping trip more efficient by displaying complementary products together, introducing store-in-the-store concepts, and adding self-scanning checkouts (Muench, 2017).

1.2 Shedding light on and measuring the in-store consumer transaction cost

The profitable servicing of customer requirements depends on the firm's market intelligence and knowledge of consumer behavior contingencies (Foxall, 2018). Price variations can be marginal, both within and across retail formats (as we have demonstrated for Norwegian retailing, our empirical setting). In the case of affluent consumers, this can put pressure on the other consumer currencies: time and effort. For retailers to manage these contingencies, they need new types of metrics based on measurements of time and effort. What is not measured cannot be well understood and managed (Kaplan and Norton, 1996). In the current paper, we contribute to retailers and the retailing literature by providing consumer efficiency models that have not been available until now. We introduce two new behavioral economic metrics in addition to a recently suggested metric based on shopping time by Bogomolova, Vorobyev, Page and Bogomolov (2016). The new metrics consist of per-item efficiency ratios based on in-store travel distance and area coverage that are now readily available through new in-store behavioral tracking approaches. The rationale for introducing these metrics will now be given.

Academic research (Bogomolova et al., 2016; Davis and Bell, 1991) on shopper efficiency in supermarkets is valuable, but the handful of academic studies is restricted to shoppers using shopping equipment, which tends to be linked with larger shopping goals and long stock-up trips. We contribute to this literature by adding data on quick trip shoppers, the targets of "grab and go" stores, operationalized as those who do not use in-store shopping equipment for carrying groceries. Aligning with the literature, we use the term quick trip shopping (Sorensen, 2016), which is not necessarily performed quickly as it conveys, first and foremost, limited shopping goals. Nonequipment usage can therefore be an objective measure, as it manifests the consumers' underlying shopping trip motive of acquiring only one or a few items (Larsen & Sigurdsson, 2019). As recent research shows, shopping trips involving a few purchased items now dominate in food retailing due to changed economic and social

circumstances (Larsen, Sigurdsson, Breivik and Orquin, 2019; Sorensen et al., 2017). Examples of such circumstances include the increased affluence of the middle class along with more retail options, increased time stress, longer working hours, a general decrease in the average size of households, and an ageing population. This suggests that efficiency is growing in importance for consumers, and the question is how do retailers deliver efficiency to those with the largest desire for it – quick shoppers in particular? Because most stores follow traditional store design principles to facilitate consumers on larger trips, there are reasons to believe that consumers buying only a few items are those who suffer most in terms of efficiency.

In this article, we conceptualize consumers' transaction cost as customer efficiency, and we introduce behavioral tracking (see Larsen, Sigurdsson and Breivik, 2017) to assess efficiency as a shopper contingency. We then discuss how consumer efficiency can be measured through the tracking of fundamental in-store behaviors using the entire shopping trip as the unit of analysis. Furthermore, we contribute to the literature with an analysis of consumer efficiency related to 497 complete shopping trips, where we distinguish between equipment users and nonequipment users. The data from the present study show that nonequipment users are significantly less efficient in completing their shopping than equipment users, which demonstrates that in-store behavioral data can reveal the consumer insights needed for managing consumer efficiency. Nevertheless, most retail stores, even new and smaller ones, are built to accommodate consumers on larger trips requiring the means for carrying the items, such as carts and baskets. Because firm decisions cannot be fully understood without analyzing both the consumer situation and the corporate situation, we further advance the theory of the marketing firm (Foxall, 1999) by considering the contingencies from other stakeholders, such as suppliers, and their effects on retail profitability.

2.0 The Marketing Firm: Retailer and Consumer Contingencies

Aligning with Drucker (1954) and Slater (2001), Foxall (2015) suggest an understanding of the marketing firm based on a behavioral logic of transactions between a marketer and its customer. From this, the existence of the marketing firm depends on transactions though activities that involve marketing and mutuality relationships (Foxall, 2002). This approach captures marketing orientation and the marketing concept, which represents a consumer-centered long-term "sense and respond" philosophy in which knowledge about customers (characteristics, needs, and preferences) form the basis for all business planning and strategy (Narver and Slater, 1990; Drucker, 1954). The theory of the marketing firm specifically addresses the need for a supplement to transaction cost analysis (Coase, 1937; Williamson, 1975) that goes beyond the effects of price on production and consumption. Coase's analysis has limitations in modern affluent market economies (Foxall 1999, 2018). Consumers have high discretionary income, they face endless choices, there is fierce competition among firms, and supply exceeds demand. Such conditions drive firms to pursue a profitable consumer response and make marketing orientation valuable.

2.1 What can explain the current retailing environment and the subsequent changes?

Foxall (2015; 2018) conceptualizes firm-customer relationships in terms of bilateral contingencies. This idea rests on the view that the behavior of managers is reinforced and punished by consumer behaviors, while the behavior of the consumer is reinforced and punished by firm decisions (Figure 1).

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The bilateral contingency between the marketing firm and the customer, as

portrayed by Foxall (2018, p. 386)

Ideally, the marketing firm responds to the insights derived from marketing research and intelligence by producing more salient marketing mixes. The prerequisite of bilateral contingency is that the firm and the customer are sufficiently closely connected to respond on each other's behaviors. These then become discriminative stimuli and reinforcers/punishers for further behavior (Foxall, 1999, 2018). Consumer behavior would therefore provide discriminant stimulus for the devising and implementation of marketing mixes that respond to changes in the nature of such behavior (Foxall, 2018).

2.2. Challenges in bilateral contingencies

Brick and mortar retailers generally lack intelligence about what happens inside their stores because they have mostly relied on transactional outcomes without attempting to understand the fundamental patterns of in-store behavior (Larsen & Sigurdsson, 2019; Sorensen, 2016; Sorensen et al., 2017; Underhill, 2009). Retailers lack key metrics on in-store behavior such as travel distance and paths, percentage of the store visited, walking speed, and shopping time, as well as the environmental contingencies and cognition affecting them - such as time pressure, experience and shopping trip goals. In addition, they lack insights about the proportions of shoppers selecting different types of carrying equipment (no equipment, basket, cart), which could provide them with an important prediction of fundamental shopping patterns and transactional value. This can be measured with a new type of behavioral tracking device (as explained later in the current paper) that creates new contingencies for retailers (market intelligence). This has the potential to create new discriminative stimuli in the form of a board of metrics affecting retailers to respond to wasted consumer time and effort.

The problem also lies in the discrepancies between contingencies stemming from consumer behavior, as well as the sometimes-competing contingencies from other stakeholders such as suppliers in retailing (see Figure 2).

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Bilateral contingency between the marketing firm and the customer (Foxall, 2018), and competing contingencies from other stakeholders

The retailer might not change his behavior as his acts are being reinforced with outcomes that are immediate, tangible and certain, while the possible risk of consumers going elsewhere is more abstract, long-term and "not certain". Furthermore, as retailers often lack individual data, they are not affected by individual churn or the variables affecting it, such as time and effort. Moreover, there are often frictions between short-term and long-term contingencies. For most producers and importers, the store is an important customer along with the end consumer. This is because the brand needs to be available in the store (Sigurdsson, 2008). That generally does not happen unless the retailer benefits from selling it. This relationship has become more peculiar and difficult in recent years, where the brands of producers and importers are increasingly competing with private labels operated by the stores (e.g., Juhl, Esbjerg, Grunert, Bech-Larsen, and Brunsø, 2006). The competition for supermarket shelves is fierce and is generally the first challenge for any new brand. A brand that is located just below eye level is *ceteris paribus*, believed to have the greatest sales compared to brands that are located on the lowest or top shelves because such locations are believed to receive less attention (from adults in general and supported by in-store experiments - see, e.g., Sigurdsson, Saevarson, and Foxall, 2009). The shelf placement is so important that producers are sometimes ready to pay considerably for the best shelf placement or section of the store (see, e.g.,

Sigurdsson, Larsen, & Didriksson, 2014, for in-store experiments involving approximately 100,000 customers and revealing large sales increases attributed to checkout placements). If suppliers do not pay directly for the shelf space, they often include compensation for it as part of joint marketing programs with the retailer (Dulsrud and Jacobsen, 2009).

3.0 Consumer efficiency conceptualized as transaction costs

If retailers behave according to the theory of the marketing firm, then changes in consumer-stated motivations and behaviors would act as contingencies for improvements in their marketing mixes. The retail offerings and consumer wants would then be more aligned, thereby increasing the attractiveness of the retailer's marketing mix. In this section, we elaborate on consumer efficiency or the shoppability of the store as a contingency for consumer behavior. We conceptualize consumer efficiency as transaction costs and address the increased appreciation of efficiency in stores characterized by a high level of task orientation. Efficiency can be defined as the comparison of what is actually performed with what can be achieved with the same consumption of resources (Atkins and Kim, 2012). As such, a consumer would be more efficient if a shopping task is done using less inputs in terms of money, time, or effort/energy. It entails consumers making competent and productive use of their resources without wastage.

Foxall (1999, 2018) anchors his theoretical ideas about the marketing firm on changed economic and social circumstances. This also applies to consumers' demand for more efficiency in purchase situations. An increase in dual-wage families has resulted in consumers with more money and less time (Brown, 1990). The share of household budgets spent on food purchases has decreased, and the number of food stores and their capacity exceeds the demand in many markets. This increase in household affluence and the great supply of retail alternatives around the clock creates a lesser need for one-stop shopping and stocking-up (Twitty, 2016).

Consequently, easy access to stores enables consumers to spend less time and effort planning their shopping trip. Consumer efficiency is the most relevant for those seeking to minimize their transaction costs relative to the outputs, or benefits, they receive from shopping. It is more reinforcing in functional shopping situations with high task orientation than in hedonic ones (Moeller, Fassnacht and Ettinger, 2009). Because task-oriented consumers perform their activities out of necessity, they have little or no inherent satisfaction derived from the activity itself (Kaltcheva and Weitz, 2006). Thus, for consumers who are task-oriented, there is a strong reason to assume that they seek to accomplish their shopping journey as quickly and effortlessly as possible. Although some consumers may find great pleasure in buying food, the majority of consumers have, to a large extent, task-oriented motivations in regard to grocery shopping (Esbjerg et al., 2012).

The meta-study by Pan and Zinkhan (2006) demonstrates that efficiency (e.g., fast checkout) is positively related to store choice. Research also demonstrates that shopping efficiency is important for consumers in terms of a satisfying shopping experience (Geuens, Brengman and S'Jegers, 2003). Furthermore, efficiency (along with product range and price) is among the most important factors for why consumers have embraced online shopping (Nielsen, 2018b). By shopping online, consumers avoid crowds, reduce their waiting time, search more efficiently, and expend less effort in travelling physically to the stores (Yang, Lu, and Chau, 2013; Rasmus and Nielsen, 2005; Morganosky and Cude, 2000). The fact that online shopping has developed into the fastest growing channel for many sectors, including food and beverages, signals that modern consumers value flexibility and time-efficient solutions (Nielsen, 2018b). Consumers are increasingly demanding more efficiency from retailers (Inman and Nikolova, 2017; Nielsen, 2014). This increasing appreciation of efficiency can have a pronounced effect on how consumers select stores and/or other purchasing channels. For instance, Walmart has experienced that consumers no longer want to visit a giant store just to

pick up eggs or milk (Banjo, 2016). A retailer can, therefore, choose to present the consumer with a more efficient store environment to attract those who want to complete the shopping trip as fast as possible. Consumers have responded by visiting food stores more frequently, buying fewer items, and spending a shorter time on each trip. Moreover, recent research across stores and countries demonstrates that most trips to supermarkets and hypermarkets globally involve a relatively small number of purchased items (Sorensen et al., 2017). Sorensen (2016) describes this as "a trend line" moving dramatically to the direction of smaller, more frequent trips to most retailers. We can conclude that measuring and managing consumer efficiency seems necessary for any retailer in the 21st century.

4.0 Measuring consumer efficiency through tracking complete shopping trips

4.1 Shopping trip types and the entire shopping trip as the unit of analysis

One of the principal tasks of a marketing firm is to acquire appropriate marketing intelligence, enabling it to select market segments and find profitable ways to serve them (Foxall, 2018). An approach for dividing customers into groups in grocery shopping has been to distinguish between different types of shopping trips where consumers behave similarly. Kahn and Schmittlein (1989), for instance, distinguish between quick trips in which a small amount of money is spent and regular trips in which a larger amount of money is spent. Sorensen (2016) uses a wider set of in-store behavioral data to cluster shopping trips, including behaviors such as how fast the consumer walks, how fast the consumer spends money, how much of the store the consumer visits, and how long the trips last. By using such an approach, Unilever America has identified three market segments in food shopping, quick, fill-in and stock-up, which exhibit distinctive shopping behaviors (Sorensen, 2016). The term quick trips in Unilever's research is a term that consumers use to describe the amount of time, effort, and money they invest in a

given trip to a retailer. It is a relative term as quick trips vary in size depending on the type of store.

In this article, we divide customers into two groups based on whether they use carrying equipment (shopping cart, basket or similar) to help them carry the items they intend to purchase. We find this approach to be relevant because equipment usage/non-usage is an objective and observable measure and one that manifests the consumers' underlying shopping trip motives without acquiring such information from the consumers themselves. It is necessary to focus on the shopping trip and not the consumer per se because a consumer can be on a nonequipment trip at lunchtime and on a stock-up trip requiring a shopping cart later that day in the same or at a different store. Because a common characteristic of nonequipment users is their intention to buy only a few items (and not more than their arms can carry), this group is of particular importance when measuring how the retailer delivers on consumer efficiency. As we have argued, this group is growing in importance, and a traditional store layout is expected to be unfit to deliver convenience and efficiency to this particular group compared to other customers (see Seiders, Berry, and Gresham, 2000; Reimers, 2014). Although retailers have traditionally tried to make the store responsive to all types of needs, it is a challenge to serve all types of customer trips equally well in the same store (Sorensen et al., 2017).

Defining the shopping trip as the unit of analysis is a fruitful approach for analyzing what goes on in the store (Larsen et al., 2017). By examining and scrutinizing entire shopping trips (from the point the consumer enters the store and all the way to the checkout), retailers acquire behavioral data on their visiting customers that go beyond a traditional basket analysis. It is an approach for marketing intelligence that has the potential to give retailers a better understanding of which types of shopping trips they currently serve and how well they serve them in terms of customers' efficiency.

4.2 Measuring consumer efficiency using fundamental behavioral metrics

Managing shopper efficiency in consumer behavior settings requires retailers to focus on key behavioral metrics relevant for meaningful calculations of efficiency ratios. Sorensen et al. (2017) propose store area visited, basket size (number of items purchased) and time spent in the store as fundamental behavioral metrics. In-store travel distance complements these key metrics, as it adds more precise insights into consumers' effort when travelling to the store. Such behavioral data are now attainable through the use of technology and software solutions, such as radio frequency identification (RFID) technology and advanced tracking software (a deeper discussion of how technology provides new opportunities for behavioral research can be found in Larsen et al., 2017).

We find research on consumer efficiency to be rather limited. Sorensen (2016) use the term spending efficiency and define this as shopper seconds (shopping duration) per dollar. As such, he treats consumer efficiency as a time-based measure of the speed of consumer activities within the retail store in relation to the money spent on shopping. This means that efficiently shopping involves consumers' spending less time buying the desired number of items. He finds store efficiency to translate into more store sales. Thus, the more efficient the store, the higher the sales. Bogomolova et al. (2016) provide a similar understanding of what constitutes an efficient shopper. They argue that the more items bought within a period, the more efficient the shopper is. Their per-item shopping efficiency measure includes "the time spent to purchase one item, including walking to the shelf, considering available options and making the purchasing decision" (Bogomolova et al., 2016, p. 110).

Travel distance and area coverage complement time-based efficiency measures. They allow for the calculation of meters walked per item purchased as well as the share of store areas visited per item purchased. We applied both time-based (per minute efficiency) and effort-based

efficiency ratios (per meter efficiency and area coverage efficiency) in the study reported in the next section.

Our main focus in this study was consumer efficiency in retail outlets with an assortment dominated by food and beverages and a store layout built on principles facilitating shopping trips involving many purchases. The research question guiding our empirical study was whether and how quick shopping trips deviate from more regular shopping trips in terms of per-item efficiencies when controlled for other influencing factors. Behavioral data derived from the consumer tracking of entire shopping trips were used for this purpose. The following subsections report on the method, data analysis, main empirical result and discussions.

5.0 Method

The research approach. In collaboration with Coop in Norway, we equipped one of its stores with multiple cameras and tracking technology to measure and analyze consumers' in-store behaviors in a real shopping environment. Due to the use of cameras and real-time observation of customers, The Norwegian Data Protection Authority was notified in advance, even though no sensitive personal data were registered as part of the study. We also informed customers about the use of in-store cameras through a sign at the entrance as the law requires. The main advantage of using the store itself as a behavioral science lab with undisguised observation and consumer tracking is that the consumers visiting the store will not change their behavior as a function of the observation technique (Parasuraman, Grewal, & Krishnan, 2006). Studying behavior naturally, without distorting the data increases the ecological validity of the results.

The context. The data were collected based on the behavioral tracking of 635 complete shopping trips taking place in one of Coop's discount stores in the northern part of the country. The store had 1200 m^2 in sales area, an assortment of 5500 stock keeping units (SKU), and a similar layout to most other food stores of this size. Similar to other markets in Western Europe

and the United States, the food retail sector in Norway has undergone a massive change characterized by a shift from independent traders to national vertically integrated retail groups with several store formats and control of multiple stores. Ninety-six-point two percentage of the Norwegian food retail market is controlled by only three retail groups: NorgesGruppen, Coop and Rema. The market shares as of 2017 were 43.1% NorgesGruppen, 29.7% Coop, 23.4% Rema, and 3.8% other retailers, including independents (Nielsen, 2018). The "lab-store" used in this research belongs to the soft discount grocery segment, which dominates the food retail sector in Norway with its 65.7% market share in 2017 (Nielsen, 2018).

Sampling. We split the stores' opening hours as well as weekdays and weekends into ten strata, and we used the entire traffic pattern to the store in February 2016 (derived from a traffic counter placed at the entrance) to determine the total number of shopping trips to target in each strata (proportionate stratified sampling). The selection of shopping trips was based on the rule of choosing every fifth shopper entering the store. Of the 635 shopping trips, 522 trips involved individual shoppers (272 males and 250 females). A shopping trip with multiple shoppers introduces sources of potential bias to the behavioral measures involved in the calculation of consumer efficiency (e.g., who should be tracked, and what if the group splits up one or several times during the trip and more than one member purchase items?). Thus, in the present study, we focus on the subsample of 522 shopping trips involving only individual consumers.

Data collection method. Wi-Fi cameras and tracking software were used to collect the behavioral data. The cameras covered the entire selling space and were used to observe the shopper's movements within the store and item purchases. An item purchase in this study is an item observed when picked by the shopper from a display or a shelf and not returned to the display/shelf. We applied the same tracking software and procedures as Larsen et al. (2017). The interface of the tracking software represented the store layout, and the pattern of movement

and item pick-ups (purchases) were fed into the tracking software in real time. We refer to Larsen et al. (2017) for more details on this software's functionality and interface, which type of data it registers automatically, and the procedures for feeding real-time observational data into the software. Camera-based observations, in combination with tracking software, have the advantage of not disrupting the shopper's natural shopping experience because there are no interventions during the shopping trip.

Selected shopping trips were observed, one-by-one, from their point of entry and all the way to the cashier desk. Entry time was defined as when the customer crossed a predefined point at the start of the shopping trip. We used two predefined entry points: one at the cash register for those shoppers taking a shortcut through the space between the cash registers and a second at the main entrance where most customers have to cross to approach the first zone displaying items. Our exit time measure was the exact moment when the customer placed the first item on the cashier desk (in case of no queue) or the moment when the customer started queuing. This leaves out time spent queuing (which is also dependent on whether there is a queue) and time at the checkout involving the scanning of barcodes, which is dependent on basket size (see Bogomolova et al., 2016). While a system consisting of RFID tags (on baskets and/or shopping carts) and antennas is unable to perfectly identify the start and end of every shopping trip (Hui, Bradlow and Fader, 2009) and captures data only from equipment users, our approach overcomes these shortcomings.

Variables and measurements. We registered demographic data (gender and age) and whether the consumer used carrying equipment immediately after the completion of the shopping trip. Two researchers were involved in tracking each of the shopping trips. In the absence of any customer interventions, we estimated age and gender based on a visual inspection of the real-time images provided by the Wi-Fi cameras, with an emphasis on the customers' face, hair and body shape. The entire store was divided into 85 store areas based on

product family categories. The software kept track of the shoppers' path within the store, store areas visited, store areas in which the individual shopper picked one or more items without returning them to the shelves/displays (purchases), travel distance (in meters), shopping duration (in seconds), item purchases, and number of items purchased (the sum of all picked items). We calculated area coverage as the total number of actual visited store areas divided by the total number of store areas and walking speed (m/s) as travel distance divided by shopping duration. Age, carrying equipment, and gender were dummy variables. Age was categorized into five different age groups (<31 years, 31-40 years, 41-50 years, 51-60 years, and >60 years), and gender (male and female) and carrying equipment (equipment, no equipment) were binary variables. Furthermore, we designed three efficiency ratios based on the in-store fundamental behaviors (key behavioral metrics). Shopping duration efficiency (number of purchases per minute) was calculated as the number of items purchased divided by shopping duration converted into minutes. We calculated travel distance efficiency (per meter efficiency) as the number of purchased items divided by shopping distance. Finally, we calculated area coverage efficiency as the number of purchased items divided by area coverage.

Analysis. Twenty-five of the 522 shopping trips involved consumers leaving the store without buying any items. These were removed from the sample because the efficiency ratios applied in this study depend on dividing the key behavioral metrics by the number of purchased items (as dividing a number on zero is undefined). This left us with a final sample of 497 observations, or approximately 95% of the original sample.

6.0 Results

The objectives of the empirical study are to examine whether and how quick shopping trips deviate from more regular shopping trips in terms of per-item efficiencies when controlled for other influencing factors. In Table 1, we present summary statistics on the key fundamental

in-store behaviors derived from the 497 observations. The table shows that there are notable differences between quick trips (trips involving no carrying equipment) and regular trips (trips where the customer uses carrying equipment). First, consumers on regular trips spend close to three times more time on each shopping trip relative to consumers on quick trips. Furthermore, consumers on regular trips travel almost twice the distance as opposed to those on quick trips. In addition, there are noticeable differences in area coverage. As anticipated, consumers on regular trips visit a larger percentage of the total store area. Finally, Table 1 demonstrates how quick trips and regular trips differ in terms of the number of items they purchase, with regular shoppers buying, on average, 9.98 items while quick shoppers buy, on average, 2.37 items.

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In further pursuit of factors associated with the consumer efficiency ratios, we enhance our analysis and test several models restricted only by the variables at hand. As R-squared does not penalize adding variables to models, we use the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) to evaluate our models. With three efficiency ratios as a point of departure, we select a common model based on the overall information assessment of AIC/BIC and find the following model to be the most suitable for our analysis:

$$Eff_i = \sum_{1}^{5} \beta_1\,Age_i + \beta_2 Female_i + \beta_3 QuickT_i + \varepsilon_i$$

The linear regression model consists of consumer efficiency *(Eff)* as the dependent variable (three separate efficiency ratios: travel distance efficiency, shopping duration efficiency, and area coverage efficiency) and *Age*, denoting a categorical variable with customer age in years divided into 5 groups (0-30, 31-40, 41-50, 51-60, 61+); *Female* is a binary variable with females representing 1 and males 0; *QuickT* is a dummy variable with 1 representing quick

trips and otherwise a regular trip. Finally, ε is the remaining error, and i is the individual shopper observed. This model is estimated using ordinary least squares (OLS) with Huber/White heterogeneity consistent standard errors.

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In Table 2, we report coefficient estimates from the analysis. Positive coefficient estimates should be interpreted as a decrease in efficiency. For the age and gender variables, the age group 0-30 years and males serve as the base, respectively. This has implications for how the coefficient estimates for the age groups and for females should be interpreted. It is evident from Table 2 that all reported age categories have a significant impact on shopping duration efficiency (from $p<0.05$ to $p<0.001$). With respect to travel distance efficiency, two out of four age categories return significant estimates, while for area coverage efficiency, three age group estimates have significant coefficients ($p<0.05$ and $p<0.01$). The estimates indicate with a few exceptions that consumers in older age categories in general are less efficient than those in younger ones. While the estimates indicate age to affect consumer efficiency, we find no such connection with respect to gender. On the other hand, the estimates imply significant (better than $p<0.01$) differences between a quick trip and regular shopping trips. For all three efficiency ratios, quick trips return the largest estimates, which indicate that this group of consumers is less efficient than shoppers on regular trips. Individual tests indicate that estimates of quick trips and regular trips are significantly different from each other.

7.0 Discussion

To the best of our knowledge, this study is among the first to investigate consumer efficiency based on the tracking of consumers' in-store travel distance and measuring how large a share

of the store areas consumers visit. Both metrics give important insights into consumers' in-store behaviors and capture consumer effort (such as walking) during the shopping trip far better than pure time-based measures. Considering the financial outlay associated with a shopping trip, both time and effort are relevant transaction costs. Thus, the three key behavioral metrics used in this study complement each other in the assessment of consumer efficiency. Furthermore, this study is the first to distinguish between quick trips (involving no carrying equipment) and regular trips (equipment shoppers) when analyzing consumers' in-store efficiency. We conducted the study in a store with a layout following the principles of accommodating larger trips (requiring carrying equipment) because most retail food stores tend to follow these principles. In addition, it is not unreasonable to suspect that such layouts are inconvenient for those buying only a few items.

Selecting target segment(s) involves tailoring the marketing mix to specific consumer needs. Although experimenting with smaller store formats, retailers still seem to stick to stores with a traditional layout, encouraging their customers to walk through the entire store. This suggests that there are contingencies other than consumer needs and wants affecting retailer decisions. To understand why retailers behave as they do, we therefore need to consider contingencies from other stakeholders, such as suppliers, and their effects on retail profitability. These are now addressed.

7.1 Contingencies from other stakeholders affecting retail profits

The theory of the marketing firm is an operant account of managerial and consumer behavior, where behavior is a function of its consequences (Foxall 1999). The model explicates how the consumer behavior setting, the social and physical environment signaling behavioral outcomes, consists of four types of discriminative stimuli setting the occasion for behavior (signaling what behavior will be rewarded); i.e., physical, social, temporal and rule-based. Each setting's

discriminative and motivational strength depends on learning history—the consumer's history of similar behavioral consequences in the past. The model offers a continuum of closed-open behavior settings based on criticism of premature, or fragmented, extrapolations of behavioral principles, analyzed in the closed setting of the laboratory (Foxall, 1993). A retail store represents an open consumer behavior setting, where consumers visit retailers physically to freely wander around and purchase groceries. It consists of physical elements and appearance that are visible to consumers, including merchandise assortment, store layout, fixtures (e.g., shelves and displays), store atmosphere, services inside the store, and price. The behavior setting in the current study consisted of 1200 m^2 of total sales area, a grid store layout with a main thoroughfare on the outside edge of the aisles similar to most food stores, minimal service, low prices, a grid layout, and an assortment total of 5500 SKUs. Retailers provide and control this consumer behavior setting, and the way they engineer its components increases the probability that behaviors advantageous to the retailer emerge (Foxall, 1999). Travel distance within the store, area coverage, and shopping duration are such behaviors, activities that retailers traditionally have associated with positive outcomes, such as sales and profit. By travelling more of the store and spending more time in the store, consumers become exposed to more stimuli that create wants or trigger temporarily forgotten needs (Kollat and Willet, 1967). These behaviors generate positive outcomes for the retailer in the form of more unplanned purchases (Hui, Inman, Huang and Suher, 2013; Inman, Winer and Ferraro, 2009). A majority of purchase decisions are made within the retail store. Instead of planning their purchases in detail, consumers use physical products in the store environment as external memory cues (Inman et al., 2009; Park, Iyer and Smith, 1989). If a given item is not among the items the consumer has planned to buy when entering the store, then a purchase of this item is contingent upon the consumer noticing the item in the retail setting while shopping (Hui et al., 2013). Not seeing is the same as not buying, and the retail industry believes in a close relationship between

the rate of exposure and the rate of sold items. Furthermore, research indicates that more than two-thirds of all grocery purchase decisions are either generally planned (only planned to the level of the category) or not at all planned (Inman et al., 2009; POPAI, 1995). Consumers making unplanned purchases are therefore extremely important for retailers.

Retailers engineer their store environments so that consumers must pass as many items and product categories as possible on each of their shopping trips, regardless of the consumers' shopping goal and time constraints. Thus, by controlling the bodily behavior of consumers, retailers frame and orchestrate outcomes (Dulsrud and Jacobsen, 2009). A classical strategy has been to scatter popular items (power items) around the store to maximize within store travel (Grandbois, 1968). Milk, juice, yogurts, bread, bananas, and soda are all examples of popular items that a significant number of consumers, at least in the past, tend to buy each time they visit the store. By locating their respective product categories around the store, the retailer encourages consumers to walk longer distances and thereby pass many other products on their way. This strategy also prevents consumers from making short cuts (Brassington and Pettitt, 2006). Consumers who only want a few basic things also need to pass many tempting items. Inconvenience is, as such, used as a means of influencing purchase behavior (Dulsrud and Jacobsen, 2009). This strategy has for decades been a guiding principle for grocery retailers, which demonstrates how strongly managers in this industry believe in it. Instead of considering consumer inefficiency as a problem, retailers seem to have it as a goal. They want to expose consumers to the largest possible number of items that they can stand to see, without annoying them so much that they respond negatively (Nestle, 2006). This demonstrates that retailers practice a form of sales orientation as soon as the customers arrive at their stores. The more they sell, the larger their market share. The larger the market share, the better the terms from brand suppliers, which causes consumers to purchase even more if lower purchasing costs are

passed on to consumers in terms of lower prices. Buying power and consumer influence, therefore, reinforce each other.

One might argue that retailers, by reminding consumers about their needs, satisfy those needs that they have temporarily forgotten and that such a practice is in the consumers self-interest as it may reduce their need for an extra trip to the store and remove any potential psychological costs of not remembering (when realizing it after coming home). However, the majority of shopping trips are now smaller and more frequent challenge this strategy. Are today's affluent consumers on small quick trips less tolerant for such practices?

Other stakeholders also exert significant influence on retailer operations. Therefore, there is a need to consider contingencies from other stakeholders and their effect on merchandise practices and retail profitability. The most influential, in terms of merchandise practices, are brand suppliers. In recent decades, their marketing budget has been increasingly directed towards retailers in the form of various types of monetary incentives and allowances (Chandon, Hutchinson, Bradlow and Young, 2009; Gomez, Rao and McLaughlin, 2007). The retail space is scarce (Marx and Shaffer, 2010) and under strict control by a relatively small number of retailers who manage fairly standardized assortments across stores. This scarce retail space is a resource that brand suppliers depend on, given the large extent of in-store consumer decision-making. Retailers therefore exert a great extent of market power, and brand suppliers compete with each other for access, attractive placements, and promotional activities in cooperation with the retailer. Retailers gain economically from such privileges as it improves retail margins and reduces costs and risks (Marx and Shaffer, 2010). Some retail specialists even point to trade and promotional allowances from brand suppliers as being the number one source of supermarket profit and that consumers are ignored by the retailer because they contribute least to the retailers' bottom lines (see Sorensen, 2016). The main sources of

supermarket profits according to Sorensen (2016) are, in order of importance, trade and promotional allowances from brand suppliers, cash flow, real estate, and margin on sale.

Brand suppliers are practically customers to the retailer in regard to the allocation of the retail space and in-store marketing, and it is in the retailer's self-interest to possess as many in-store locational spots as possible that possess "value" in supplier-retailer negotiations. The attentional effects of placing items on the middle shelves (eye level) are well known, and so are the effects on brand sales from large increases in total shelf space, such as end-of-aisle displays (Chandon et al., 2009). End-of-aisle displays (end caps) are part of a larger range of activity spots where brand items can receive special placements in the store during a certain time. They are effective because the retailer orchestrates the in-store migration pattern in such a way that most consumers pass them. The store layout in most food stores is characterized by 1) systematically arranged aisles (grid pattern) combined with some open environments (e.g., the produce section and the fruits and vegetables section) and 2) a main thoroughfare along the perimeter (a main corridor) of the store that effectively function as a "home base" for any customer, leading the consumer around in the retail space along a largely predictable route (Larson, Bradlow, and Fader, 2005). A grid pattern with a main thoroughfare maximizes the number of activity spots with the potential of exposing all consumers to the displayed items (opportunity-to-see). Changing the store layout to cater better to consumers on quick trips may reduce the number of attractive in-store activity spots and consequently the value that can be extracted from them in retailer-supplier negotiations.

Another aspect concerns the composition and heterogeneity of the consumers' utility functions. There are values determining consumers' utility functions other than convenience and efficiency, most notably price and assortment. The larger the assortment, in terms of the number of stock keeping units, the more inconvenient the store is for quick trip shoppers buying only a few items. Furthermore, a store's price level is contingent on both the retailer's buying

power (towards brand suppliers) and its operational efficiency. Smaller and more convenient store formats are less efficient to operate than larger formats. Smaller stores, therefore, require a higher overall price level per see. Walmart's experience with express stores provides some anecdotal evidence. Given Walmart's strategy to be a price leader, which is largely dependent on scale, Walmart Express stores appeared to be a misfit for the company (Forbes, 2016). Due to their experiences, they decided in 2016 to shut down all of their Walmart Express stores. Price and assortment would most likely be negatively correlated with consumer efficiency, at least for consumers on quick trips. Consumers must therefore strike a balance between competing values. The result is that consumers visit non-efficient stores despite the availability of more efficient alternatives. Many consumers may accept lower shopping efficiency to achieve lower prices and access to an assortment above a certain minimum level. This can also go the other way, that is, when consumers visit a convenient store despite highly valuing price and assortment. In this situation, consumers abandon large format stores, such as supercenters and hypermarkets, because the efficiency disadvantages outweigh the benefits that these stores offer in terms of one-stop shopping and low prices. It is natural to expect that consumers' purchase intentions (e.g., number and types of items they plan to purchase) and time constraints are influencing factors in such assessments. In this perspective, both time and money are currencies consumers bring to the store (Sorensen, 2016), and both currencies need to be accounted for to understand consumer choice.

New store designs and adjustments within store layouts, customer flow, and placement of items are sources of retail shopper confusion that hinder shopping goal achievements (such as efficient shopping), lead to frustration, evoke negative emotions, and increase consumers' mental effort (Garaus, Wagner, and Kummer, 2016; Ryan, 2012). This means that if retailers want to make layout changes to better cater to shoppers on frequent quick trips, they risk creating frustration and irritation among all of their customers, even among those that form the

basis for the measures. It takes time for customers to familiarize themselves to a changed retail environment. There might also be consumers deciding to switch to a retail environment more aligned with their cognitive map because of such changes. Thus, more fundamental and radical changes in the retail environment require the retailer to take on a longer-term perspective. It is therefore more likely that retailers respond in a more incremental manner to changes in consumer behavior that require structural changes in their stores. This means smaller and less noticeable changes in store layout, item placements, and customer flow.

To make it easier for consumers to find items and make purchase decisions, retailers can shrink their assortment in terms of the number of SKUs offered in their stores. However, stores compete for consumers, and consumers vary enormously in what they look for and in what they see (Sorensen, 2016). A consequence is that each consumer has a different opinion on what the store should stock, and a larger assortment is therefore necessary to make the store attractive to a significant proportion of consumers. This is also the main challenge for retailers attempting to identify typical items purchased on quick trips, so that they can make it more efficient for consumers on such missions to complete their shopping task (also called a "quick-trip" paradox in food retailing, see Twitty, 2016). Consumers are very heterogeneous in the items they buy. One consumer may run into the store just for a light bulb, while another needs a sauce for the steak that is in the oven.

7.2 Conclusions

Time and effort represent transaction costs for a growing number of consumers who put value on efficiency in shopping situations. We have presented behavioral data demonstrating that a typical retail store, representative of the largest segment of the Norwegian grocery retail sector, delivers higher per-item efficiency for consumers on regular shopping trips (trips involving carrying equipment) than for consumers on quick trips (who use no carrying equipment and

buy only a few items). We attribute this mainly to the store layout, which is based on traditional design principles that force shoppers on quick trips to walk through the entire store despite their few needs, spending more time and effort than necessary. Because retailers lack in-store behavioral data related to consumers on quick trips and on the size of the quick trip segment, their decisions rely largely on insights from transactional data. Time and effort, as consumer transaction costs, will hardly act as contingencies for retail managers as long as they do not use behavioral tracking data from consumers' in-store journeys. However, their customer orientation might increase as markets develop (e.g., more focus on time and effort; more specialized stores).

To develop an understanding of why retailers behave as they do, we also point to the need to consider other contingencies that go beyond consumer wants and requirements. As we have discussed in this paper, for the retail sector, this includes, among others, the influence of other stakeholders (suppliers in particular), main sources of retail profit, retailer efficiency, and the fundamental role of unplanned purchases in food retailing. Consumer inefficiency is not necessarily a problem for retailers because other contingencies are even more important at the moment (such as retailer efficiency, market share, and implications of joint marketing programs). Therefore, how retail marketing firms respond to changes in consumer wants cannot be fully understood by analyzing only the relationship between the retailer and its customer base. Other retailer contingencies would also need to be considered.

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Data Sharing Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Table 1. Summary statistics

Variable	Quick trip		Regular trip		Overall	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Shopping duration (min)	3.36	2.45	9.48	6.59	6.25	5.75
Travel distance (m)	95.98	42.89	187.55	81.56	139.28	78.74
Area coverage (%)	14.50	5.67	24.99	6.55	19.46	8.04
Number of items purchased	2.37	1.11	9.98	6.32	5.97	5.83
Shopping duration efficiency	1.60	1.30	1.00	0.44	1.31	1.03
Travel distance efficiency	47.45	30.65	21.44	8.12	35.15	26.35
Area coverage efficiency	7.18	4.27	2.97	1.06	5.19	3.81
N	262		235		497	

Table 2. Estimates of consumer efficiency

Dependent variable	Shopping duration efficiency			Travel distance efficiency			Area coverage efficiency		
Age: -30[1]									
Age: 31-40	0.275	*	(2.36)	5.69		(1.85)	0.971	*	(2.17)
Age: 41-50	0.239	*	(2.09)	2.27		(1.04)	0.380		(1.15)
Age: 51-60	0.608	***	(3.32)	11.38	*	(2.43)	1.503	**	(2.66)
Age: 61+	0.696	***	(4.68)	9.62	**	(3.00)	1.508	**	(3.06)
Male[1]									
Female	0.124		(1.49)	-2.13		(-1.05)	-0.311		(-1.05)
Quick trip	1.107	***	(7.35)	38.28	***	(11.18)	5.483	***	(11.87)
Regular trip	0.553	**	(3.12)	14.83	***	(3.76)	1.696	**	(3.19)
F/Prob>F	176.91		0.0000	240.27		0.0000	230.75		0.0000
R-sq/adj. R-sq	0.658		0.653	0.715		0.711	0.735		0.731
AIC/BIC	1401.70		1431.20	4559.40		4588.80	2615.70		2645.20

* $p<0.05$, ** $p<0.01$, *** $p<.001$, t statistics in parentheses, [1]=base, N=497, OLS with robust errors