



Assessing the principles of spatial competition between stores within a retail network



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ABSTRACT

This study investigates the impact of driving time and retail agglomerations on consumer store choice within a retail network. A pairwise comparison of confluencing store trade areas is conducted based on loyalty card information and exit questionnaires for six retailers operating in different product categories in Belgium. Results show that there is a stronger emphasis in the preference hierarchy on driving time towards a store for the daily goods retailer. Moreover, there is varying intra-network spatial competition depending on the type of location strategy pursued by the different retailers. Results show that for some retailers retail agglomeration effects are more outspoken than for others. However, impact of driving time on consumer intra-network store choice was independent of retail agglomeration size. Finally, results indicate that opening stores outside the pursued location strategy should be approached with care as significant impacts on sales cannibalization can emerge within the store network. These findings are important for crafting an overall expansion strategy for expansion managers as well as for marketing managers occupied with network changes at operational level.

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Introduction

Retailers in expansion are often faced with the challenge of assessing the impact of a store network extension on the performance of their existing stores within the network. To accurately understand this impact, it is advisable to look at the shopping behavior of customers and how it is affected when faced with a modified retail landscape. Academic research already revealed a wide variety of insights in drivers of store choice and resulting theoretic choice models. However, these models and frameworks largely ignored specific spatial competitive dynamics of store within a retail network, often referred to as sales cannibalization (Drezner, 2011). Recently, more research has been conducted on this topic, focusing on the relevant spatial and non-spatial drivers to accurately assess shifting store choice and cannibalization of sales within a retail network (De Beule, Van den Poel, & Van de Weghe, 2014; Pancras, Sririam, & Kumar, 2012). Knowledge around these specific drivers within a retail network can aid

expansion managers with their expansion location choice, in order to avoid, for example, heavy cannibalization of sales on existing stores nearby.

This study focuses on the specific impact and spatial dynamics of driving time and retail agglomerations on intra-network consumer store choice and hence cannibalization of sales within a retail network. Knowledge about, for example, consumer tendency to prefer a multipurpose shopping trip to a large retail agglomeration over multiple single-purpose store trips to smaller retail agglomerations, is vital for a retailer to accurately assess the impact of a modified store network. If consumers will find a higher utility in combining shopping trips in one big trip to a large agglomeration, then a planned new store opening in a big, attractive retail agglomeration will have a widespread cannibalizing impact across multiple stores of the network located in smaller retail agglomerations.

Most academic studies have researched such impacts from the consumer's point of view in a well-defined regional scope or through controlled lab-experiments in order to reveal the drivers for store choice. However, assessing drivers for store choice within a retail network from a retailer's point of view requires a broader geographic scope to ensure the representativeness of the results and, desirably, a benchmark with different retailers to assess the

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relative impact for these drivers. This study is, to the best of our knowledge, the first that compares the spatial competitive intra-network dynamics for multiple retailers. To this end, loyalty card information and exit questionnaires are used to detect spatial patterns in consumer intra-network store choice preferences. With the use of loyalty card and exit questionnaire information, it is possible to construct store trade areas which can confluence in certain *competitive areas*. By comparing the sales distributions in these competitive areas, the spatial competitive dynamics blueprint of a retailer can be assessed. Data from six retailers selling products from three different product categories, each with their unique location strategy are examined to allow for a cross-market, cross-location strategy comparison of the spatial dynamics blueprints within their retail network. In doing so, this study aims to extend literature in two ways. Firstly, geographic sales data of retailers offering a variety of product categories are compared for the first time in regard to their unique intra-network spatial competitive blueprint. Secondly, this study also compares the competitive trade areas of retailers offering the same category of products but following a different store location strategy. A location strategy aimed at standalone stores will arguably yield different spatial competitive dynamics between stores than a retailer aiming at opening stores in high streets. In this study, the impact of agglomerations is assessed in relation to the retailer's expansion strategy.

The remainder of this paper is structured as follows. First, the current state-of-art in literature on assessing trade areas is reviewed and the vast research around multipurpose shopping is summarized. Next, the methodology and test design sections describe how the geographic sales data of the different retailers are used to assess the spatial competition within their store networks. The results section then unfolds the different forms of spatial competition between the studied retailers. Last, conclusions and managerial implications are discussed.

Literature overview

Due to the increasing interest in objective optimization of retail network performance, research has begun to emerge around this topic. Pancras et al. (Pancras et al., 2012) look into the case of a fast-food chain where they investigate the varying impact of network changes, pricing and customer satisfaction on the sales of existing restaurants. The model that was presented also included a parameter related to the distance from census tracts to the different restaurants to incorporate spatial competitive dynamics. The authors however lacked sales data at census level to verify the spatial dynamics used in the presented model.

Agglomeration effects have been the subject of much more research, albeit mostly from a consumer point of view. From this perspective, a consumer seeks to maximize its shopping utility by engaging in multipurpose shopping trips. Arentze, Borgers, & Timmermans (1993) investigated the influence of offer diversity in retail agglomerations to assess the increased willingness of consumers to include these stores in a one-stop multipurpose shopping trip. This research was extended by Dellaert, Arentze, Bierlaire, Borgers, & Timmermans (1998) and Arentze, Oppewal, & Timmermans (2005). Also, Brooks, Kaufmann, & Lichtenstein (2008) assessed the impact of varying driving times and offer configurations on store choice in a controlled lab experiment. The increased utility due to travel cost minimization by combining shop purposes in one trip has also been investigated by Dellaert, Arentze, & Timmermans (2008). Rotem-Mindali (2012), in turn, found that retail centers that accommodate multipurpose shopping are not necessarily located in close proximity to major residential concentrations. However, the resulting downside of longer travel times

are largely compensated when having a good road-based accessibility.

A first empirical application of multipurpose shopping dynamics in the grocery market can be found in Popkowski Leszczyc, Sinha, & Sahgal (2004) where the authors also take the location and price strategy of the retailers into account. Next to derived consumer benefits, agglomeration effects are also induced by benefits for retailers and real estate developers. Increased competition in larger retail environments puts downward pressure on prices but this is at least partially offset by increased volumes sold (Beggs, 1994; Brando, da Silva, & Pinho, 2014; Smith & Hay, 2005). To avoid extreme price competition however, clustering of retailers mainly occurs between retailers that can sufficiently differentiate their offering from competitors within the same retail agglomeration (Picone, Ridley, & Zandbergen, 2009). This is especially necessary as larger retail agglomerations tend to have higher rental prices (Rosiers, Theriault, & Lavoie, 2009), putting even more pressure on the retailer's profit margins.

Applied to a retail network, agglomeration effects have been included in various predictive analytic models. Roig-Tierno, Baviera-Puig, Buitrago-Vera, & Mas-Verdu (2013) included a measure of passing trade in their analytical hierarchy process (AHP) for retail site location decisions. In spatial interaction models, Huff (1963) developed a gravity model to predict the trade area of shopping centers. This model was later extended to accommodate for measuring agglomeration effects on store attractiveness (Black, 1983; Craig, Ghosh, & McLafferty, 1984). Applications of this type of spatial interaction models where agglomeration effects are explicitly accounted for can be found in Satani et al. (1998), Li & Liu (2012) and Orpana & Lampinen (2003).

Moreover, spatial competition drivers within a retail network are known to be very important in a franchiser-franchisee case. The effects of sales cannibalization or *encroachment* of an expansion case within a franchise firm has been assessed by Kalnins (2004). Also, literature contains a fair amount of research around models to resolve these expansion conflicts. Cox & Mason (2009) investigated how a model can contribute in delineating store trade areas and geographic trade rights. Also, different expansion strategies can be crafted based on what objective the franchisees seek to maximize with their retail network configuration, like minimizing sales cannibalization or maximizing total market share (Current & Storbeck, 1994; Ghosh & Craig, 1991; Kolli & Evans, 1999; Plastria, 2005; Surez-Vega & Santos-Peate, 2014; Surez-Vega, Santos-Peate, & Dorta-Gonzalez, 2012). This paper contributes to this discussion in a way that spatial competition patterns can be assessed using known geographical sales within the network and that impact of retail agglomerations can be assessed in an objective way to include this factor correctly in a conflict resolution model and in the discussion around expansion within the franchise chain.

Methodology

This section explains how spatial competitive dynamics of intra-network store choice is assessed. Such an assessment can yield insights in how customers value drivers for store choice when choosing between different stores of the same brand to make a purchase (Fotheringham, 1988). This in turn, leads to valuable knowledge for the retailer on how stores compete for the same customers. In other words, they gain insights in the spatial intra-network competitive dynamics. Through loyalty card information, it is possible to investigate such customer behavior as it links a geographically located customer with its behavior towards different stores from the same brand. Moreover, loyalty card information and exit questionnaires provide such information on a large scale, which is necessary to discover valuable insights in a real

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