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ENTRY OF MALLS AND EXIT OF STORES - THE ROLE OF DISTANCE AND ECONOMIC GEOGRAPHY

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Entry of malls and exit of stores

- The role of distance and economic geography

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The empirical literature on the effects of external malls on incumbent stores is inconclusive, and quantitative research on this topic is limited. In an attempt to add to the literature, this study examines the effect of the entry of external retail malls on store survival. Using a full firm population panel dataset at the store level covering the period 2000-2014, we examine the effect of a change in the distance to an external retail mall on the probability of retail store exit. In doing this we explicitly model the economic geography. We measure the economic activity in the location where these stores are situated using a market potential measure to gauge the economic density. The main result of this study is that the effects differ depending on where the incumbent firm is located. The effects on firms located in low-density areas and those on firms located in high-density areas differ dramatically. In low-density areas we find complementary effects which means that the probability of incumbent store exit is lesser. In high-density areas the estimated effect is the opposite, the entry of a new external mall increases the probability of incumbent store exit. The strength of the effects is dependent on the distance between the incumbent firm and the newly established external mall. Additionally, the size of effects differs between different parts of the retail sector. Effects remain over a number of years after entry of external malls but become smaller over time.

Keywords: external shopping malls, complements, retail, panel-data, firm-exit, market potential

JEL codes: D22; L81; C33; P25

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1. Introduction

The retail industry has been in a state of flux for a long time. Modern retail can be said to have started in conjunction with the Industrial Revolution. In particular, since the mid-20th century, the retailing industry in Europe has experienced a series of transformations. These changes can b generally separated into three phases. The first major change followed the end of World War Two, with the physical reconstruction of European cities, when a built-up consumption demand stimulated the emergence of large-scale retail facilities.

Second, the development of the EU into a “common market” with harmonized rules and regulations was characterized by firms evolving in terms of their organization and management. Hypermarkets and superstores at the edges of towns met the demand for more differentiated and higher quality products.

The third and current phase is defined by the technologies and logistics that have enabled once-national firms, such as Tesco and Carrefour, to evolve into Europe-wide actors, the likes of which now form a large share of the European economy (Dawson 2006). In summary, the three stages can be said to have been driven by (1) modernized cities with better transportation (public and private), (2) political ambitions to create larger and more efficient markets, and (3) the development of (information-) technology that has enabled more efficient and logistically complex operations.

Of most interest for the purpose of this study is that in this latest phase, the European retail market has become characterized by increased market concentration. This means that there has been a decrease in the number of small-scale and microfirms (Dawson 2006). Additionally, this has led to a reallocation of retailing from city centers to external out-of-town shopping retail clusters (Gorter et al 2003).

This transformation has been viewed with both optimism and pessimism about the expected consequences. On the one hand, supporters argue that this progress results in productivity gains, lower prices and an increased variety of products (Maican & Orth 2017). It is maintained that it leads to an improved service supply (such as longer opening hours) and a transformation of creative destruction in the retail industry, which has led to a renewal of city-center retail and related services that increase their attractiveness (Bergström 2010). On the other hand, those in opposition to this development argue that external shopping centers crowd out existing retail establishments in city centers and residential areas. By doing so, they reduce the accessibility of retail services to consumers (Ljungberg et al 2006). This perceived threat from mall development has therefore led to calls for regulation.

It is safe to say that there is no consensus in the literature about the consequences to "other incumbent retail businesses" of the establishment of new external malls. Some studies show positive consequences (Fennel & Robertson 2007), while others indicate negative consequences (Bergström 2000; Thomas et al 2004; Rämme, 2009) for surrounding retailing activity. Most of the existing literature on retail cluster entry looks first and foremost at the effects of the entry of big-box stores . As external retail shopping malls have a more extensive variety of products, similar to that of city and town centers, their impact is probably different from that of big-box stores.

There is a lack of quantitative studies dealing with the establishment of external shopping malls. The present study aims to complement the existing literature with a quantitative assessment of the effect of a change in the distance to external shopping malls and exits from retail activity by incumbent retail establishments.

Retail firms tend to cluster geographically. There are many reasons for this, including that stores selling complementary goods that consumers usually purchase together tend to be located together. Additionally, stores selling goods that are substitutes, and therefore compete with each other, will cluster under some circumstances. This may happen if for the individual store the positive effect of drawing more customers to the area is larger than the effect of more competition over these customers between stores.

A mall is a specific type of cluster. The formation and contents of a mall are planned and managed. However, in planning the establishment of a new mall, management needs to think about what mix of complementary and substitute goods is optimal overall. Undoubtedly, the mall influences the success of the stores that are part of the mall offerings to customers. A successful mall will attract customers which benefit the stores in it.

However, of course, the mall will also impact stores located outside the mall. The most important factor determining the size of the effect on stores outside the mall is most probably the distance between the store and the mall. Most likely, the influence will be larger when the distance is shorter. However, it is not always self-evident in which direction the effect will work. In essence this will be dependent on the degree of substitutability or complementarity between the store and the mall which is determined by what kind of goods the store is selling and what is on offer in the mall.

In this study, we will investigate such effects. In particular, we are interested in being able to draw conclusions about the direction and size of effects. The goal is to be able to inform policy makers at the local and regional levels what the effects are likely to be when new external malls are being planned to enter. If this type of investment impacts where shoppers go it will change the demand for infrastructure and public transport. The industry itself will benefit from being able to predict the effects from this type of investments. Finally, it may be important to inform the general debate on the topic as these types of developments have the potential to influence the wellbeing of the public through influencing changes in shopping behavior and location.

In doing so, we also realize that it is important to take into account the type of environment the incumbent store is operating in. How will the relationship look in more or less densely populated areas where the population and the size of the demand is very different?

Using firm-level registry data for establishments (stores) in the retail sector, this study examines the probability of exit of retail establishments following a change in the distance between the store and the nearest external shopping center. Since malls generally do not close down the change in distance will be an effect from the founding of new malls. The period of study covers the years 2000 to 2014. Registry microdata on the firm level were obtained from Statistics Sweden. Data on external retail centers were provided by HUI Research and Datscha Sweden.

Using detailed geographical information on store location relative to the location of external retail clusters, the distance between them can be calculated with precision. In our main analysis, we develop a model with a fixed-effects estimator. This is to capture the within effects of a change in distance. We control for the presence of big-box stores and local neighborhood or community centers as well as city malls and outlet centers.

The main result of this study is that the effects differ depending on where the incumbent store is located. Effects differ dramatically for stores located in economic low-density compared to economic high-density areas. Economic density is measured as a market potential using wage sums to capture the economic activity in the area. The strength of the effects is dependent on the distance between the incumbent store and the newly established external mall. Additionally, the effects differ among different parts of the retail sector. In lower-density areas of economic activity, the relationship is more complementary. In higher-density areas, the relationship is more competitive.

This general result holds for the five subsectors of the retail industry that we perform separate analyses of. Competitive effects dominate for stores in the subsector food, beverages and tobacco and the subsector nonspecialized goods. More complementary effects dominate in the subsectors specialized goods, clothing and household appliances.

In summary these results show that the effect of the founding of an external mall impacts different parts of the retail sector differently when it comes to the probability of exit of incumbent stores. The location of these stores is of importance for understanding both the direction and size of effects.

We add to the literature in several ways. We model the importance of the distance between the stores that are possibly influenced by the newly established mall and the mall in a very explicit way and analyze its effects conjunction with economic density. To our knowledge, this approach is novel to the literature. We are able to accomplish this using registry data that cover the whole economy and firms (stores) that are geo-coded in a detailed way.

The rest of this paper is organized as follows. In section 2, we introduce theories traditionally used for understanding retail competition and location. Next, we present a monopolistic competition model to highlight how consumer demand influences the location of retail as a consequence of competition that under some circumstances leads to complementary effects among different parts of the retail industry. The last part of section 2 is used to review the most relevant results from previous literature. Section 3 introduces the data used and explains the empirical method. Section 4 provides and interprets the empirical estimation results. Section 5 concludes the paper.

2. Theory and related literature

2.1 Fundamental retail location theory

In the following subsection, we will present traditional theories and models concerning retail. In the next subsection, we introduce a model designed to illustrate competition within and among groups of retail activities.

Theories relevant to understanding the location of retail establishment have a long history.Dating back to the early 1900s, the central place theory (CPT) formulated by Christaller (1933) and augmented by Loesch (1938) explains the patterns of economic settlements based on the order of the services or goods supplied in different places.

The CPT states that different settlements have a different degree of centrality, which determines the types of goods supplied at each location. Goods that are not bought very frequently (e.g., furniture or electronics), called higher-order goods, require a larger market to enable them to break even than the market required for lower-order goods that are more frequently purchased (e.g., groceries).

Given the density of demand, the ability to sell a certain amount of goods requires a certain market size in geographical terms. This necessary market area is called the threshold (Dicken & Lloyd, 1990), and the size of this threshold varies with the order of the good or services. In a recent study (Öner & Klaesson, 2015) this variation is also demonstrated in the leisure services sector. They found that services such as special events, which are less frequently purchased, were less dependent on local demand, while services such as restaurants and other culinary establishments, which are more frequently visited, were primarily dependent on local demand.

As the distance from the supplier to the consumer increases, the increased transport costs for the consumer will result in a diminishing demand for the product. At some distance, the demand will fall to zero. The distance to this point is called the range (Dicken & Lloyd, 1990). Just as for the threshold, the range for higher-order goods is larger than that for lower-order goods. Ray (1976), for instance, illustrated this by measuring consumers' willingness to travel to obtain different types of goods. He found that the willingness to travel was higher for optical services (an example of a less frequently needed service) than it was for lower-order goods such as food.

Since places that provide higher-order goods will have a large range, they will be more dispersed than places that provide lower-order goods only. Places supplying higher-order goods generally also supply lower-order goods. This means that higher-order places are larger and more diversified than lower-order places.

Firms in retail and complementary services will tend to locate themselves in larger places to benefit from agglomeration economies that make them more productive (Marshall, 1921). Marshalls three main sources of these economies are a shared infrastructure and a shared labor pool and knowledge spillovers. The strength of each of these effects will vary by industry. In the retail literature, other types of positive externalities are also used to explain colocation. Stores selling similar products will benefit from colocation due to demand spillovers deriving from, e.g., comparison shopping. Studies have shown that consumers engage in comparison shopping to reduce uncertainty as well as to search for lower prices (Handel 1970, Roselius 1971).

Based on Hotelling's (1929) principle of minimum differentiation, Wolinsky (1983) showed that comparison shopping generates profits that motivate establishments to cluster. This is also one of the reasons for the existence of shopping malls.

Establishments providing dissimilar goods or services have incentives to cluster too. For these establishments, the demand spillover is generated by multipurpose shopping (Eaton & Lipsey 1982; McLafferty & Ghosh, 1986).

The propensity to co-locate tends to vary between firms, depending on the order of the good that is supplied. For instance, in a recent study of retail structure in a Swedish metropolitan area, Larsson and Öner (2014) find negative colocation tendencies for establishments that sell lower-order goods, such as groceries, as well as establishments selling higher-order goods in the form of durables. Positive colocation propensities are found between more specialized stores such as clothing and household appliance stores; however, their location patterns are quite complicated.

At larger distances between the consumer and store demand decreases. Competitive effects between places will dominate in the form of smaller probabilities of attracting consumers. Based on the works of Reilly (1929) and Converse (1946), Huff (1964) models how the probabilities of consumer shopping are negatively influenced by the relative supply on offer of competing markets and the distances between consumers and stores. This means that with increasing distance, the positive demand spillover will decrease, and the negative effects of competition will increase.

Due to demand spillovers, the most attractive place for retail establishments to be located is at the center of consumer activity. The demand for a location is reflected in its rental costs which is the foundation in bid-rent theory. Bid-rent theory was founded in von Thunen's book "The Isolated State" (Dicken & Lloyd, 1990) and the theory of land use was later extended to an urban setting by Haig (1926). It shows that there is a trade-off between proximity to the trading place and the rental cost of the location. Because different types of retail and leisure services have different needs for space as well as different thresholds, these establishments will also have different levels of willingness to pay for a location and hence will have different preferences for locations. As shown by Garner's (1966) theoretical model and empirical study of Chicago, establishments of optimal location tend to vary with their good's or service's threshold, which is linked to the order of the good or service. Variation in location patterns based on the order of a good has also been found by Scott (1970) regarding the location of establishments within malls. Similar results are found in a recent study by Larsson and

Öner (2014). They found that retailers of goods using smaller facilities tend to be highly dependent on proximity to demand and therefore often are found in or near the core of a marketplace.

Drawing on the above theoretical considerations, the presence of an external shopping mall is likely to exert competition effects. However, in close vicinity of the mall, positive externalities in the form of demand spillovers may dominate.

2.2 A monopolistic competition model of complementarity in retail

In the following section, we will outline a model designed to provide a basis for thinking about substitutability and complementarity between goods and the implications for location choices. The approach is based on Matsuyama (1992, 1993, 1995). If there exists a complementarity between different consumer services, we should expect them to locate in clusters. The example Matsuyama (1995) gives is the clustering of theaters and restaurants that are clearly complementary to each other. Less obvious is why stores retailing similar products would cluster, since they compete with each other for the same customers. Nevertheless, this type of clustering is a general feature of retail store location, and in the theory section above, this is explained by demand spillover. The model sketched out below will shed more light on this phenomenon, starting with consumers who are maximizing utility. It is a fairly standard monopolistic competition model with roots in Dixit and Stiglitz' (1977) seminal article.

Assume that consumers derive utility from the consumption of two composite differentiated goods, X_1 and X_2, aggregated by the following constant elasticity of substitution (CES) function:

$$V(X_1, X_2) = \left(X_1^{\frac{\varepsilon-1}{\varepsilon}} + X_2^{\frac{\varepsilon-1}{\varepsilon}}\right)^{\frac{\varepsilon}{\varepsilon-1}} \qquad (1)$$

In this context, we interpret them as the same type of goods sold by two different groups of stores, types 1 and 2. One group consists of stand-alone stores that can be located anywhere, and the other group consists of stores located in an external mall. ε denotes the intergroup elasticity of substitution. Each composite good is defined by the following CES-type index:

$$X_i = \left(\sum_{j=1}^{n_i} q_j^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\sigma}{\sigma-1}}, \sigma > 1 \quad (2)$$

where n_i denotes number of goods in each of the two groups. σ represents the intragroup elasticity of substitution. In the case $\varepsilon = \sigma$, there is no difference in substitutability between the two groups of goods and within the groups. This means that if (2) is inserted into (1), the resulting expression collapses to (2) but with n_1+n_2 varieties. We use the restriction $\sigma > 1$ to allow for some good q_j not being consumed at all. The specification above implies one important feature that has made this type of model popular in many fields. Assuming that all q_j are consumed in the same amount, thus $q_j = q$. This means that $X_i = n_i^{\sigma/\sigma-1} q$, which in turn means that utility per total consumption increases with the number of varieties. What keeps the number of varieties down is the assumption that there are scale economies in their production. Without this assumption, utility can be increased by just adding more varieties and consuming less and less of each. The scale economies are introduced by adding a fixed cost to the total cost of production. Profits can be expressed as a function of q, and if the marginal and fixed costs are the same, the ratio of profits, $\frac{\pi_1}{\pi_2}$, will equal the ratio of quantities, $\frac{q^1}{q^2}$, produced:

$$\frac{\pi_1}{\pi_2} = \frac{q^1}{q^2} = \frac{X_1}{X_2}\left(\frac{n_1}{n_2}\right)^{\frac{\sigma}{1-\sigma}} = \left(\frac{P_1}{P_2}\right)^{-\varepsilon}\left(\frac{n_1}{n_2}\right)^{\frac{\sigma}{1-\sigma}} = \left(\frac{n_1}{n_2}\right)^{\frac{\varepsilon-\sigma}{\sigma-1}} \quad (3)$$

It can be shown that the second equals-sign is true using the expression above, which relates variety to utility. The third equals-sign is correct because the relationship between demands will be the same as the relationship between price indices raised to the negative power of the elasticity of substitution. The last equals-sign is true based on the expression determining the price index ($P_i = n_i^{1/1-\sigma} p$).

Expression (3) above shows how the relationship between σ and ε determines the relationship between the number of varieties and the profits. If the within-group substitutability is larger than the between-group substitutability, that is, $\sigma > \varepsilon$, then profits are negatively related to the number of varieties. If there are too many varieties in one group, profits will be lower, and firms exit until profits are at their normal level; the opposite occurs if there are too few firms. If the two groups represent two locations (one with independent firms and the other with firms located in a mall) and if these locations are equally attractive ex ante and the consumers can only choose to visit one, they are (close to) perfect substitutes, and $\varepsilon > \sigma$. Then, the profit level is positively related to the number of stores, and the entry of new firms will benefit existing firms. This leads to complementarity at the location level, and stores will tend to agglomerate to one of the locations.

The intuition behind this can be expressed in the following way (Matsuyama, 1995). When (new) shops in your location reduce prices, you lose some of your customers. This effect is captured by σ. Nevertheless, it may be that the lower prices attract more customers to the location, some of which frequent your store, increasing your business. This effect is captured by ε.

In the context of the present study, let us assume that we have a location with several independent firms. Next, an external mall is established with firms that compete with the incumbent firms. Prices will be lowered (by more competition), but there will be more customers in this area. Which effect will dominate? The model itself do not inform on this point, so to a large extent it is an empirical question.

In the model above there are no other characteristics of the locations other than the distribution of retail firms. In reality places are different in other dimensions too. The most important characteristic is probably the size of a place in terms of population or economic activity. Drawing on the theoretical considerations in the former section the central place theory predicts that larger places will be more diversified. Economies of agglomeration is expected to enhance productivity in bigger places which means that competition should be stronger too. In larger places we should expect more specialized firms that need larger market areas to be located. These higher order goods can only be sold in the bigger places while lower order goods can be sold in smaller places too.

The first observation should lead to that competition effects are bigger in bigger places and hence should lead to a higher probability of exit for incumbent firms. The second observation should lead to that stores that sell higher order goods are relatively less influenced in the bigger places compared to smaller ones. The rest of this study is devoted to investigating the validity of these expectations. In the next section, we discuss some of the literature that has addressed similar questions.

2.3 Related literature

In this section, we introduce literature that is related to the aim of this paper. The overall results from the literature show that there is no consensus on how spatial competition plays out in the context of the retail sector. This suggests that results are dependent on particular circumstances and are not easily generalized.

The existing literature on large-scale retailing reports both positive and negative effects on the local and regional environment. As an amenity, large-scale retailing may be beneficial for an area by increasing its attractiveness to visitors. Daunfeldt et al. (2017) found a positive purchasing power inflow to municipalities that have an IKEA store.

With an inflow of visitors, the overall consumer-related activity may increase. Artz and Stone (2012), for instance, examining the effect of Wal-Mart on towns in Iowa between 1976-2008, found that there was an overall increase in retail sales as well as in the sales of eating and drinking establishments in the Wal-Mart host towns. Moreover, Basker (2005), also studying Wal-Mart entry, found that there was an increase in overall retail employment following the entry of Walmart. Haltiwanger et al. (2010), for instance, found in a study of big-box retailing in the Washington DC area between 1976 and 2005 that employment growth in restaurants benefited from the proximity to large-scale retailers.

While large-scale retailing in many cases increases the overall retail sales in a region, the increased competition may have a harmful effect on some retail establishments from the competition by cheaper and more easily accessible (by car) large-scale retailers. In a qualitative study from 1995 by Marjanen et al. on the Finnish market, consumers' shopping behavior before and after the expansion of an out-of-town retail park was studied. The findings indicated that there had been a general shift in consumption patterns from traditional town center shopping towards externally located retail parks. In a study from 2004 by Thomas et al., interviews with consumers revealed that there had been a general shift towards shopping in out-of-town retail parks. A later qualitative study by the same authors (2006) of the British market presented similar findings. Based on surveys conducted in 2003 and 2004, it was found that, as the external shopping centers evolved into suburban "high streets", consumers tended to favor the out-of-town shopping center at the cost of the traditional shopping venues in the town centers.

In a study of shopping malls' impacts on small-scale establishment retail around Johannesburg in 2006, Lighthelm (2008) found that the majority of nearby township retailers experienced a decrease in profitability following the first six months of shopping mall entry. Similar results were found in a later study by Astbury and Goodwin (2014) on the retail markets in England and Wales between 2005-2010. Using retail rent per square meter as a proxy for retail performance, the authors found that town centers near the shopping mall entry site tended to have a lower rent per square meter than across town centers in general, which indicated that the shopping mall had a negative effect on retail performance in the nearby area.

In a study on external retail centers in Sweden between 1997-2007, Rosén & Rämme (2009) examined the effect of external large-scale retailing clusters on central municipality town centers' and peripheral neighboring municipalities' retail sales. While only slight effects were found in the central municipality town centers, retailers in the neighboring peripheral municipalities experienced a significant decrease in retail turnover.

Just as sectors that are complementary to retail may benefit from large-scale retail centers, so may retailers of goods that are complementary to those of the big-box or external shopping mall. Jones and Doucet (2000), for instance, found that competitors to big-box stores in the Toronto area generally decreased in numbers, while the opposite was true for retailers of complementary goods. In the study by Haltiwanger et al. cited above (2010), similar effects were found.

While large-scale retailing and its effects are well documented in the research, there are two areas where the literature is still lacking. The majority of studies are focused on the effects of big-box entry, while there are very few studies on the effects of externally localized retail malls. As an external mall or retail cluster is likely to offer a greater variety of both high-order and low-order goods as well as services, it is even more of a substitute for existing economic activity in the city/town centers and for other retail clusters. Therefore, its impact on local and regional activity may be different.

3. Data and empirical design

3.1 Description of data

In this section, the data used are presented with some definitions and descriptive statistics. We used two data sources to build the data set used in the empirical analysis. First, we used a comprehensive registry database maintained by Statistics Sweden. From this database, we obtained detailed geographical information as well as data on exits at the store level. Second, we obtained information including geographical coordinates on external retail centers from HUI Research & Datscha Sweden. The combined dataset covers the time period from 2000 to 2014 and consists of 73,037 stores that were active at some point during the period. This results in a panel dataset containing 303,000 observations. Based on the geographical coordinates for the stores and the malls, the distances between each store and each external mall were determined for all years during the period.

One of the two main variables of interest is the distance between a store and the nearest external mall. The other is market potential which we measure by accessibility to wage sums (see below). We wish to understand how these are related to retail store exits. We control for the distance to the closest of a number of retail cluster types. The 5 different types of retail clusters included in the empirical study are presented and characterized in Table 1 below.

The retail clusters were formed based on information about the different types of retailing activities available in the Datscha database. Using similarities in the type of retail supply and type of location, some available categories in the database were aggregated. Our main category in the analysis is *External Malls,* which consists of an aggregate of what the database calls Regional malls and Superregional malls. The other retail clusters that we used as controls are *(i)* City malls, which are similar to external malls but located in city centers and thus not "external"; *(ii)* Local centers, which consist of community and neighborhood centers that mostly offer convenience goods; *(iii)* Outlet centers, which primarily provide durable goods; and *(iv)* Retail parks, which consist mainly of big-box stores (i.e., large retail establishments with a wide variety of goods for sale).

In Table 1, we present the characteristics of the different retail clusters. The largest of them are *external malls,* of which there are 46. The *external malls* are the largest both in terms of floor space and number of tenants. City malls are much more numerous

(106) but are smaller and have fewer tenants than external malls. The local centers are also smaller and offer a different supply that is oriented more towards convenience goods. Outlet centers are different in that they consist of one big store, often selling durable goods. The most numerous (129) types of retail clusters are retail parks consisting of a few big-box stores located together in some proximity.

Table 1: Five types of retail clusters and their characteristics

Type of retail cluster	Obs.	Type of supply	Size (sqm)	No. of tenants
External mall	46	Extended/much-extended supply	20,000-70,000	>50
City mall	106	Extended supply in or close to city center	5,000-	>5
Local center	80	Balanced/convenience-based supply	5,000-20,000	7-35
Outlet center	5	Emphasis on durable goods supply	5,000-	1
Retail park	129	Big-box/large big-box store supply	5,000-	>5

Table 2 provides the descriptive statistics for the variables used in the empirical analysis. The unit of analysis is the incumbent store that may or may not exit. In the data, an exit is measured by a dummy variable, and an exit is recorded as a 1. The mean for this variable is 0.164. That means that slightly more than 16 percent of the observations indicate an exit.

The stores we analyze do not belong to a chain. This means that they are more directly dependent on the market at the place where they are located. This also means that they are not influenced positively or negatively by the strategic considerations of the management of retail chains that may optimize the outcome for the entire chain rather than for each store individually. However, franchise firms are included in this category; they are, generally speaking, responsible for costs and investments at a store level, and there is no transfer of funds a between stores belonging to the same franchise, which makes them dependent on the local conditions.

Next in Table 2 are the variables measuring the distance between the retail establishment and the different retail clusters. The distances are measured “as the crow flies" using the coordinates of the retail establishment and the different clusters. The distances are measured in kilometers and the average distance ranges between just over 21 kilometers for city malls to just over 145 kilometers for outlets. The average distance is negatively correlated with the number of clusters. The range of the distances goes from essentially zero up to a large number in the hundreds and, in one case, to just over 1000 kilometers. A number close to zero means that there are incumbent firms already close to the location where the mall is constructed. The large distances reflect stores located in the very sparsely populated parts of Sweden. The distance to the closest of each of the retail clusters is calculated yearly. When new external retail clusters enter an area, the distance to the nearest cluster changes as a result.

In the analysis, we also included store size in terms of the number of employees. This is to account for the fact that larger establishments generally have more resources and are more resilient to changes, e.g., increased competition. We included this variable linearly and in quadratic form to account for the possibility that the effect diminishes after a certain size. The next variable is the number of employees per areal unit (km^2)working in the retail sector in the neighborhood of the retail firm. Neighborhoods are defined as SAMS[1] areas. There are approximately 9000 SAMS areas in Sweden. This variable was included to take into account whether the neighborhood is a place with much retailing activity. If it is a popular place for retailing, stores located there are likely more resilient to exit. It may be that the neighborhood is an advantageous location because there is useful infrastructure or some other helpful factor there.

The last variable presented in Table 2 is market potential. This variable is important for retail location since it is designed to measure how (potential) demand varies geographically. In essence, it measures economic density, in that it takes into account where economic activity takes place by recording the wage sums of the working population by municipality. There are 290 municipalities in Sweden. In general, these municipalities are of limited size, and there are many types of interaction across municipality borders (e.g., commuting and shopping trips). For this reason, dependencies exist across municipality borders. Therefore, what is important for a retailer is not only the potential demand that originates from the municipality where it is located but also from the neighboring and surrounding municipalities. To account for this, we used a methodology that includes accessibility measures. The method is

[1] Small Areas for Market Statistics (SAMS)

based on the earlier works of Johansson, Klaesson & Olsson (2002, 2003) and Johansson & Klaesson (2007, 2011). The accessibility to economic activity (wage sums) is calculated as a sum of the activity in the municipality where the store is located, the economic activity in the labor market region and the economic activity elsewhere. The market potential (*MP*) in municipality r located in region R can be expressed as:

$$MP_r = MP_{ir} + MP_{iR} + MP_{oR} \tag{4}$$

where:

$MP_{ir} = w_r \exp(-\lambda_r t_{rr})$, municipal accessibility to wage-sums in municipality r.

$MP_{iR} = \sum_{k \in R} w_k \exp(-\lambda_{iR} t_{rk})$, regional accessibility to wage sums in municipality r.

$MP_{oR} = \sum_{l \notin R} w_l \exp(-\lambda_{oR} t_{rl})$, extraregional accessibility to wage sums in municipality r.

Municipal accessibility is the sum of all wages in the municipality weighted by the exponential of the average driving times (t_{rr}) between zones in the municipality times a distance decay parameter (-λ_r). Regional accessibility is the sum of all wages in other municipalities in the same labor market region, likewise, weighted by a distance decay parameter (-λ_{iR}). Extraregional accessibility is the sum of all wages in all municipalities outside the region. The values of the three different distance-decay parameters take on three different values that are estimated from commuting flows between Swedish municipalities by Johansson et al. (2003). The numbers for market potential in Table 2 are the logarithms of the *MP* measure described above.

Table 2: Descriptive statistics

Variables	Obs.	Mean	St. Dev.	Min	Max
Retail Establishment exit	303,452	0.164	0.371	0	1
Dist. to External Mall (100 km)	303,452	0.399	0.478	0.000415	3.567
Dist. to City-Mall (100 km)	303,452	0.213	0.296	0.000192	3.618
Dist. to Local Center (100 km)	303,452	0.399	0.601	0.000124	5.251
Dist. to Outlet (100 km)	303,452	1.455	1.620	0.000569	10.303
Dist. to Retail Park (100 km)	303,452	0.206	0.283	0.0000806	3.103
Employees	303,452	4.223	9.611	1	585
Retail employees per km2 (SAMS)	292,368*	408.741	1066.818	0.0000958	14481.56
Market potential (in logs)	303,452	23.680	1.309	19.393	26.176

* For a number of stores information about the SAMS area was not available

The establishment exits were estimated as an aggregate but were also estimated within five subgroups. The reason for this is that different types of stores may react differently to changes in their distance to external malls. The subgroups consist of retail stores grouped according to the similarity of the goods they sell. The five subgroups were*: clothing, household appliances*, *specialized goods*, *nonspecialized* and *food, beverages and tobacco*. Descriptive statistics for these subgroups can be found in Table 3 below.

Table 3: Descriptive statistics and definitions for subsamples

Sector	N	Plants	Exits	Definition
Clothing	45,268	11,026	7,894	Clothes, shoes, bags, etc.
Household appliances	54,159	12,314	7,518	Furniture, electrical goods, paint, wallpaper, etc.
Specialized goods	109,772	26,748	16,761	Jewelry, secondhand, photography, etc.
Nonspecialized	49,657	11,947	8,183	Large-scale consumption goods
Food, Beverages, Tobacco	44,596	13,181	9,490	Small-scale food retailing, beverages and tobacco
Sum	303,452	75,216	49,846	

4. Empirical design and model

In this section, we outline the empirical model used for the estimation of exits. We estimate the relationship between the probability of exit of incumbent retail firms and the entry of external malls, while controlling for other types of retail centers, and firm- and location-specific variables. We specified the model as follows:

$$P(E_{it} = 1|\Phi, \Psi, \Omega) = \Phi\beta^{or} + \Psi\beta^{f} + \Omega\beta^{L} \quad (5)$$

where E_{it} is the exit of establishment i at time t, which equals 1 if the firm in fact is closed at that time. In the empirical estimations we run estimations where exit takes place at time t+1, t+2 and t+3. Φ contains changes in the distance to *external malls*. Φ also includes the distances to other types of malls and retail clusters. Ψ encompasses information about the individual firm and Ω contains location-specific information. β^{or} are parameters to be estimated related to the distance to other retail firms; β^{f} are parameters related to the firms itself; and β^L are parameters related to the location of the firm.

The parameters were estimated using a linear probability approach with a fixed effects estimator at the store level, using the heteroskedastic robust standard error option. By doing this, we examined the within-variation relationship between the dependent variable and the distance to the nearest external mall, controlling for other retail clusters as well as firm and location characteristics. We use a linear probability model for several reasons. First and foremost, central to our research question is the interaction between the distance to the nearest external mall and economic density as measured by market potential. Disentangling the effects of interacting variables is much more straightforward in a linear model than in, e.g., a logit model. Additionally, the linear model runs much more quickly than other models, and we are not interested in predicting probabilities (Angrist & Pischke, 2008)

The next step involved estimating the parameters in a fixed effect setting for the subgroups of retail firms introduced in Table 3 above. Last, we investigated the duration of the effects by estimating the changes in the probability of exit one, two and three years after a change in the distance to the external mall occurred.

5. Empirical results and interpretation

5.1 Baseline results

In the following section, we present the empirical results. The regression results from the fixed effects models are presented in Tables 4, 5 and 6.

In Table 4, we present the results from running six specifications and adding more variables for each specification. Our main variables of interest are the distance to the nearest external mall and the market potential (including their interaction). In the first column, we only include the distances to all the different types of retail clusters. All of them are negative and statistically significant. Thus, the entry of an external mall means that the probability of exit for the incumbent store increases.

Analyzing the coefficients is a little bit tricky. The change in distance from the entry of an external mall is a negative change. That is, the only effect on distance of the establishing of new malls is that some incumbent stores find that their closest external mall is now closer. There are no external malls that have shut down during the study period so there are no instances of increased distances. It follows that an estimated negative coefficient means that a new external mall increases the probability of exit.

Adding firm size in terms of the number of employees did not change the sign or substantially change the magnitude of the coefficients relating to the distance to the retail clusters. Increases in firm size were correlated with a lower probability of exit, albeit at a diminishing rate. After this, we introduced the number of retail employees per km^2 in the neighborhood and the market potential. The presence of more retail employees diminished the risk of exit. A higher market potential increased the probability of exit. In adding these variables, we noticed that they influenced the significance and even the sign of several distances to retail cluster variables. The distances to external mall and retail park became insignificant. The distances to city mall and local center switched sign and became positive. The distance to outlet was the only distance variable that stayed relatively unchanged. Next, we added industry dummies at the three-digit level. None of the coefficients changed substantially, and the significance levels remained the same.

Table 4: Probability of Retail Establishment exit (Fixed effects)

	(1)	(2)	(3)
Dist. to External Mall (100 km)	-0.219***	-0.224***	-0.00732
	(0.0144)	(0.0143)	(0.0154)
Dist. to City-Mall (100 km)	-0.0911***	-0.0926***	0.0225
	(0.0130)	(0.0132)	(0.0137)
Dist. to Local Center (100 km)	-0.233***	-0.241***	0.0383***
	(0.0142)	(0.0143)	(0.0141)
Dist. to Outlet (100 km)	-0.0811***	-0.0825***	-0.0306***
	(0.00151)	(0.00150)	(0.00174)
Dist. to Retail Park (100 km)	-0.114***	-0.118***	0.00659
	(0.00554)	(0.00555)	(0.00606)
Employees		-0.00942***	-0.0122***
		(0.000938)	(0.000992)
Employees2		2.00e-05**	2.30e-05***
		(7.85e-06)	(8.19e-06)
Retail density (SAMS)			-7.66e-06***
			(2.01e-06)
Market potential (MP)			0.488***
			(0.00598)
MP*Dist. to External Mall			
Constant	0.505***	0.552***	-11.33***
	(0.00902)	(0.00973)	(0.145)
Obs	303,452	303,452	292,368
R-sq	0.016	0.020	0.057
No. Firms	73,037	73,037	71,737
Year FE	N	N	N
Industry FE	N	N	N

Table 4 continued.

	(4)	(5)	(6)
Dist. to External Mall (100 km)	-0.00754	-0.0126	1.406***
	(0.0154)	(0.0155)	(0.180)
Dist. to City-Mall (100 km)	0.0225	0.00440	-0.0207
	(0.0137)	(0.0137)	(0.0137)
Dist. to Local Center (100 km)	0.0384***	0.0200	0.0173
	(0.0141)	(0.0141)	(0.0141)
Dist. to Outlet (100 km)	-0.0306***	0.00273	0.00356*
	(0.00174)	(0.00197)	(0.00197)
Dist. to Retail Park (100 km)	0.00661	0.0101*	0.000284
	(0.00607)	(0.00610)	(0.00616)
Employees	-0.0121***	-0.0121***	-0.0122***
	(0.000992)	(0.000986)	(0.000985)
Employees2	2.30e-05***	2.29e-05***	2.29e-05***
	(8.19e-06)	(8.13e-06)	(8.11e-06)
Retail density (SAMS)	-7.68e-06***	-7.84e-06***	-8.35e-06***
	(2.01e-06)	(1.99e-06)	(2.00e-06)
Market potential (MP)	0.487***	0.252***	0.228***
	(0.00611)	(0.0309)	(0.0308)
MP*Dist. to External Mall			-0.0620***
			(0.00788)
Constant	-11.32***	-5.929***	-5.383***
	(0.149)	(0.725)	(0.723)
Obs	292,368	292,368	292,368
R-sq	0.057	0.066	0.066
No. Firms	71,737	71,737	71,737
Year FE	N	Y	Y
Industry FE	Y	Y	Y

Heteroscedasticity and serial correlation robust[2] standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

[2] As specified by White (1980) and Newey & West (1987).

Next, we added year fixed effects. The result was that all distance measures to retail clusters became insignificant, with the exception of the distance to retail parks. The coefficients for the other variables remained virtually the same. The last amendment to the estimation was to introduce an interaction variable for the distance to external mall and the market potential. These two variables are the most important variables for the analysis. We saw earlier that adding the market potential variable made all but one of the distance variables insignificant. This indicates that this variable is extremely important. The results show that once again, there was a change in how the distance variables worked, but this time, only the distance to nearest external mall was significant (which is one of the two interaction variables). The coefficient for distance to nearest external mall became positive and significant at the one percent level. This means that the establishment of an external mall nearby reduces the probability of exit of other retail firms. However, the coefficient for the interaction variable is significantly negative. Therefore, the effect of the reduced risk of exit of the stores is diminished by the larger market potential. This general result is in line with the discussion of what to expect from the modeling of complementary and substitute (competitive) relationships. This means that the effect of the establishing of a new external mall will depend on the size of the market potential. In places with a small market potential the establishing of an external mall will decrease the risk of exit. In places with a large market potential the effect will be the opposite and increase the risk of exit of incumbent stores.

5.2 Results for subgroups of retail industries

In Table 5, we present the results from running the fully controlled model from Table 4 on the probability of exit in the five retail subgroups. The results are similar across subgroups. We focus on the distance variables and market potential. The direct relationship between the distance to the nearest mall and the probability of store exit was positive for all of the five subgroups. The same patterns hold true for the interaction variable between the distance to the nearest mall and the market potential. All five are significantly negative.

Table 5: Probability of Retail Establishment exit by retail subgroup (Fixed effects)

	Clothing	Household appliances	Specialized goods
Dist. to External Mall (100 km)	1.914***	1.596***	0.559*
	(0.506)	(0.355)	(0.328)
Dist. to City-Mall (100 km)	-0.0287	-0.0373	-0.00670
	(0.0440)	(0.0379)	(0.0209)
Dist. to Local Center (100 km)	-0.0150	0.0702**	0.0210
	(0.0405)	(0.0281)	(0.0222)
Dist. to Outlet (100 km)	0.0101**	0.000669	0.00391
	(0.00511)	(0.00406)	(0.00334)
Dist. to Retail Park (100 km)	-0.00245	-0.0101	0.00367
	(0.0166)	(0.0130)	(0.0106)
Employees	-0.0258***	-0.0151***	-0.0173***
	(0.00191)	(0.00126)	(0.00182)
$Employees^2$	0.000237***	1.86e-05***	6.61e-05**
	(3.17e-05)	(1.94e-06)	(2.91e-05)
Retail density (SAMS)	-9.32e-06**	-2.21e-05***	-5.38e-06*
	(4.44e-06)	(6.44e-06)	(2.86e-06)
Market potential (MP)	0.274***	0.120*	0.131**
	(0.0866)	(0.0650)	(0.0526)
MP*Dist to External Mall	-0.0836***	0.0681***	-0.0241*
	(0.0221)	(0.0157)	(0.0142)
Constant	-6.455***	-2.800*	-3.070**
	(2.036)	(1.516)	(1.233)
Obs	43,765	51,797	105,819
R-sq	0.077	0.065	0.064
No. Firms	10,824	12,007	26,222
Year FE	Y	Y	Y
Industry FE	Y	Y	Y

Table 5 continued.

	Non-specialized	Food, beverages, Tobacco
Dist. to External Mall (100 km)	1.238***	2.025***
	(0.330)	(0.743)
Dist. to City-Mall (100 km)	-0.0476	0.0181
	(0.0349)	(0.0363)
Dist. to Local Center (100 km)	-0.00508	0.0595
	(0.0347)	(0.0440)
Dist. to Outlet (100 km)	-0.00610	0.0217***
	(0.00461)	(0.00654)
Dist. to Retail Park (100 km)	0.0108	-0.0133
	(0.0122)	(0.0239)
Employees	-0.0109***	-0.0425***
	(0.000941)	(0.00286)
Employees2	3.62e-05***	0.000616***
	(6.27e-06)	(0.000116)
Retail density (SAMS)	1.83e-06	-6.30e-06
	(5.76e-06)	(6.23e-06)
Market potential (MP)	0.379***	0.152
	(0.0632)	(0.123)
MP*Dist to External Mall	-0.0556***	-0.0925***
	(0.0148)	(0.0326)
Constant	-8.796***	-3.644
	(1.483)	(2.921)
Obs	47,887	43,100
R-sq	0.060	0.107
No. Firms	11,786	12,978
Year FE	Y	Y
Industry FE	Y	Y

Heteroscedasticity and serial correlation robust standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

To illustrate our results and make them more accessible, we calculated the combined outcome of the direct and interactive relationship. What we are interested in is the relationship between the probability of exit of incumbent retail firms and the distance to external malls at different levels of market potential. We performed this calculation for all five retail subgroups. The result is presented in figure 1 below. On the horizontal axis is the market potential. It goes from 20 to 25, which is about the range of this variable, as can be seen from the descriptive statistics in Table 2. On the vertical axis is the change in the probability that an incumbent retail firm exits from the market when the distance to the nearest external mall diminishes due to the founding of a new mall closer by. The change in this probability is what is expected from a one unit decrease in the distance to an external mall, i.e., if the closest mall after the change is one hundred kilometer closer (since we measure the distance in hundreds of kilometers).

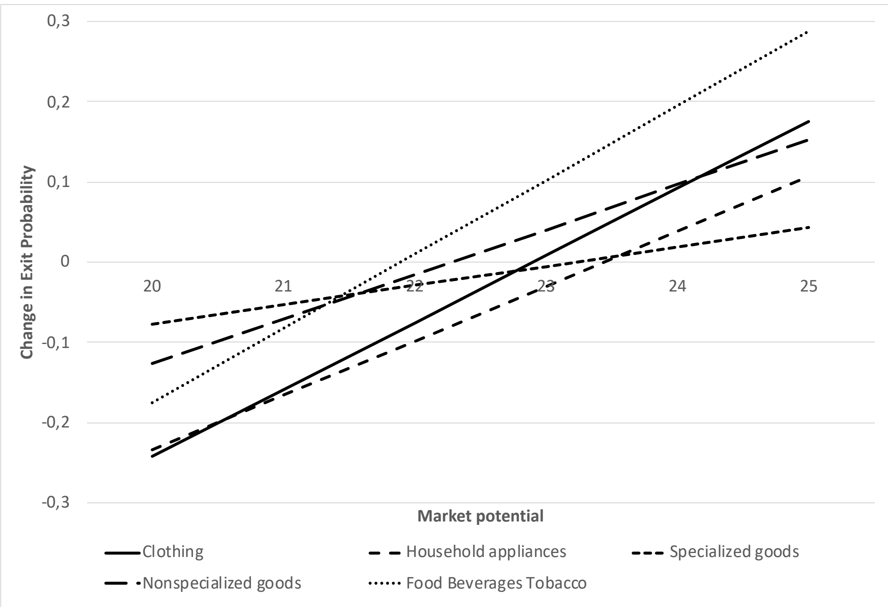

Figure 1: Change in store exit probability related to a one-unit (100 km) decrease in distance to the nearest external mall by market potential

The five different lines represent the five different subcategories of retail firms. The general pattern is that they all slope upwards. This means that the relationship is negative (decreased risk of exit) for low values of market potential and positive (increased risk of exit) for high values. In lower-density environments of economic activity, the relationship is more complementary. In higher-density environments, the relationship is more competitive.

This general result holds for all five subgroups. There are marked differences, however, in both the level and the slope of the lines presented in figure 1. We see that the line representing the specialized goods group is the flattest one. Therefore, for this group of products, there are small competitive and small complementary effects from external malls in both low- or high economic density circumstances. The line with the greatest slope represents food, beverages and tobacco. These represent typical lower-order goods. The pattern is similar for the other products. The line representing clothing stores is relatively steep, while the slopes for nonspecialized goods and household appliances fall somewhere in between.

If we compare where the lines cross the horizontal axis, we can determine the range of the positive or negative effect on the probability of store exit. The dotted line for food beverages and tobacco crosses the axis below 22. The line for nonspecialized goods crosses just above 22. The line representing clothing cross the horizontal axis just below 23. The lines indicating specialized goods and household appliances cross the axis about halfway between 23 and 24, however their slopes are different as pointed out above.

This means that the competitive effect of increased probability of store exit is covering most places for food, beverages and tobacco. The second most places covered is for nonspecialized goods. On third place comes clothing. Fourth and fifth place belongs to specialized goods and household appliances. The general pattern of effects is that stores that sell more lower-order goods are more influenced compared to the ones selling more higher-order goods.

In summary these results show that the effect of the founding of an external mall impacts different parts of the retail sector differently when it comes to the probability of exit of incumbent stores. The location of these stores is of importance for understanding both the direction and size of effects.

5.3 Duration of effects

The results presented so far represent relationships that occur in the same time period. This means that we are looking at the probability of the exits of incumbents in the same time period as the change in the distance to the nearest external mall. In reality, this may not be the timing of these events. For instance, there are instances when expectations play a big role. If it is known that an external mall is going to open, incumbents may react before this happens if they expect it will impact their store negatively. The other possibility is that firms will try to survive as long as possible, even if they are not competitive to survive in the long run. Then, we should expect to see a delayed exit occurring sometime after the new external mall is established. The first possibility, of early exit, is not possible to estimate using our methodology. The variables that are specific to each store cannot be measured or calculated after the firm has already exited. Therefore, we focus on the possibility of a delayed relationship.

In Table 6, we present the results for the probability of exit one year, two years and three years after the new external mall is established. The general patterns of the results are the same as before. The coefficients for the variable distance to the nearest external mall are positive and significant for all three estimations. The pattern over time is that the effect in the current year is larger than the effect in the next year, which in turn is larger than the effects after two years, and so on. Thus, the effects decrease as the time period increases, but they remain statistically significant.

Table 6: Probability of Retail Establishment exit by year of exit (Fixed effects)

	One year later	Two years later	Three years later
Dist. to External Mall (100 km)	0.921***	0.865***	0.827***
	(0.189)	(0.192)	(0.207)
Dist. to City-Mall (100 km)	0.00635	-0.00217	0.0160
	(0.0127)	(0.0164)	(0.0153)
Dist. to Local Center (100 km)	0.00448	0.00270	-0.0400*
	(0.0149)	(0.0161)	(0.0210)
Dist. to Outlet (100 km)	0.000124	0.000308	0.000504
	(0.00200)	(0.00205)	(0.00205)
Dist. to Retail Park (100 km)	-0.00174	-0.00309	0.000400
	(0.00641)	(0.00665)	(0.00664)
Employees	-0.00522***	-0.00381***	-0.00383***
	(0.000377)	(0.000295)	(0.000331)
Employees 2	8.47e-06***	5.68e-06***	7.10e-06***
	(2.33e-06)	(1.34e-06)	(1.88e-06)
Retail density (SAMS)	-2.06e-06	-4.82e-06*	-5.76e-06
	(2.14e-06)	(2.73e-06)	(3.77e-06)
Market potential (MP)	0.190***	0.156***	0.144***
	(0.0320)	(0.0344)	(0.0382)
MP*Dist to External Mall	-0.0411***	-0.0379***	-0.0369***
	(0.00823)	(0.00840)	(0.00920)
Constant	-4.522***	-3.723***	-3.374***
	(0.751)	(0.807)	(0.895)
Obs	220,336	175,155	141,890
R-sq	0.058	0.055	0.053
No. Firms	45,361	33,447	26,174
Year FE	Y	Y	Y
Industry FE	Y	Y	Y

Heteroscedasticity and serial correlation robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Turning to the coefficients for the interaction between the distance to the nearest mall and the market potential, we see an analogous pattern. All parameters are statistically significant and negative. Again, the magnitude of the coefficient is the largest for the current year, smaller for the next year and smaller still for two years after the establishment of the external mall. In figure 2 below, we illustrate the combined effect of the direct and interactive effects.

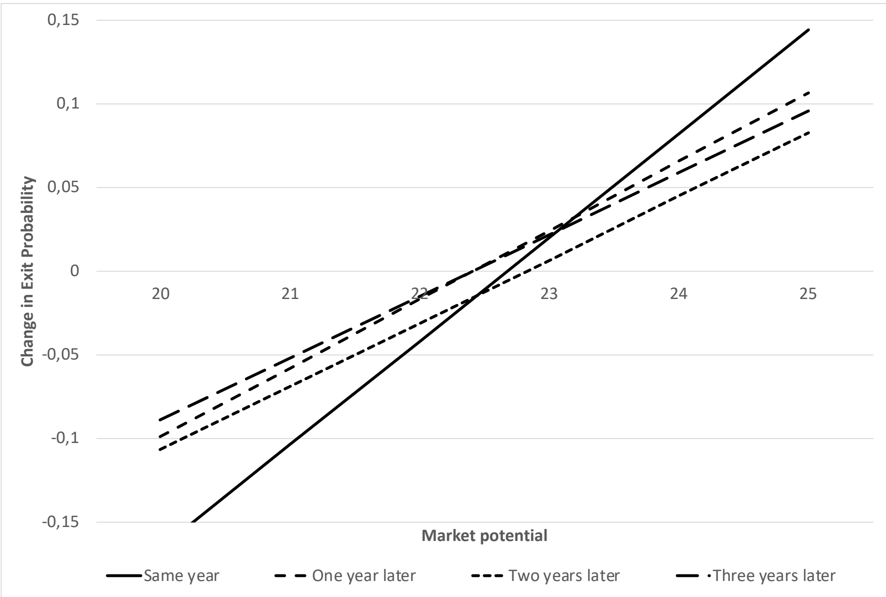

Figure 2: Change in store exit probability related to a one-unit (100 km) decrease in the distance to the nearest External Mall by Market potential. Relationship in the same year, one year later, two years later and three years later

The four lines represent the current year and one, two and three years into the future. From the solid line representing the current effects, we observe that it is the most negative at low levels of market potential and most positive at high levels of market potential. Consequently, the slope of the same-year line is the highest. The line representing a one-year delay has a slightly greater slope than the line representing a two-year delay. The three-year delay line shows the smallest (negative) effect for low levels of market potential and the next smallest (positive) effect for high levels of market potential.

The general pattern of results is that the effect of a new mall on stores exit probability last over several time periods but becomes weaker over time.

6. Concluding remarks

Previous research on the effects of large-scale retail is inconclusive. While there is a vast literature that examines the effects of big-box stores on firm survival, there is little empirical research on the effects of external shopping malls. To examine the validity of the arguments in favor as well as against shopping malls and to complement the literature, this study examines the effect of external shopping malls on the survival of active retail establishments.

The main result of this study is that the effects differ depending on where the incumbent firm is located. The effects on stores located in low economic density areas and those on firms in high economic density areas differ dramatically. The strength of effects is dependent on the distance between the incumbent firm and the newly established external mall. Additionally, the effects differ between different parts of the retail sector. Some parts of the sector are virtually not influenced at all, while others seem to be very sensitive.

In places where the market potential is high the competitive effect dominates and in places where the market potential is low the more complementary effect dominates. The general result is that in more urban areas (with high market potential) new external malls increase the probability of the exit of stores. In more rural or less densely populated areas (with low market potential) new external malls decrease the probability of the exit of stores.

In other words, in lower-density places of economic activity, the relationship is more complementary. In higher-density places, the relationship is more competitive.

This overall outcome holds for all subgroups of the retail sector that we have investigated. Nevertheless, there are distinct differences in both the level and the slope of the estimated lines presented above. We used the lines to interpret the difference in effects from getting an external mall closer depending on the overall economic activity in the area as measured using aggregate wage sums.

A relatively steep line indicates that effects on the probability of exit are large both negatively and positively. The steepest lines are the ones representing stores selling clothing and food, beverages and tobacco. Two sectors have an intermediate slope. These are nonspecialized goods and household appliances. The flattest line is recorded for specialized goods.

Also, where the lines cross the horizontal axis is important. The more to the right the line cross the horizontal axis, that is at higher values of the market potential, the larger the market potential must be for the effect to be one of competition. So, if we look at where the lines cross the horizontal axis, we can establish the scope of the positive or negative effect on the probability of store exit. The line for food beverages and tobacco crosses the axis at the lowest value. The line for nonspecialized goods crosses more to the right. The line representing clothing cross the horizontal axis even more to the right. The lines indicating specialized goods and household appliances cross even a bit more to the right.

These results say that the competitive effect of increased probability of store exit is present in most areas for food, beverages and tobacco. The second most areas with a competitive effect is nonspecialized goods. On the next place we find clothing. The next to last and last place belongs to specialized goods and household appliances. This ordering of the subsectors is more or less going from low-order goods to high order goods. So, it seems that a general pattern is that low-order goods is more influenced by external mall entry compared to high-order goods.

These outcomes demonstrate that the consequences of the establishing of external malls influences the probability of exit of incumbent stores in the retail sector differently. Also, the geographical location of the incumbent stores is of significance for both the direction and size of effects. Our results also say that effects remain over a number of years from the entry of an external mall. However, effects become smaller over time.

One conclusion for policy then is that when policy makers try to attract or prevent external malls to enter their region, they ought to take into account the specificities of the region in question.

This study also points to a conclusion that may explain why studies of this topic are complex and why results differ among studies in the previous literature. The different dimensions of the identified effects interact with each other. Stores belonging to different parts of the retail sector react differently. All this is expected to make general and universal relationships rare.

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