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INSTITUTE OF RETAIL ECONOMICS

IKEA ENTRY - EFFECTS ON FIRMS IN RETAIL AND HOSPITALITY

HELENA NILSSON

HFI WORKING PAPER No11

IKEA entry - Effects on firms in retail and hospitality

Helena Nilsson^{§*}

This study examines the entry effects of a durable goods big box, IKEA, on incumbent firms in the retail, accommodation and restaurant sectors in Sweden. Using a difference-in-difference approach combined with matching, the effects of IKEA entry on the net turnover and employment of incumbent firms located at varying distances from the new IKEA store are examined. The results show that entry by IKEA increases the net turnover of retail firms near the entry site that sell complement goods, indicating that IKEA entry causes demand spillovers due to multipurpose shopping. IKEA entry also increases the net turnover of accommodation firms in the region, which indicates that the entrant has a positive effect on the attractiveness of the area. The estimations reveal no effects on retail firms located in the affected city centers, which suggests that retail in central places may have a certain resilience to competition from out-of-town retail clusters. No robust effects on substitute goods retailers or restaurants are found.

Keywords: IKEA, retail, hospitality, agglomeration economies, competition, difference-in-difference

JEL codes: D22, L81, L83, C33.

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1. Introduction

The entry of large-scale retailers (big boxes) into local markets has been a subject of heated debate for decades. On one side of the debate, it is argued that the big boxes displace the sales of competing firms in the local market, which also has a negative effect on local town centers (Goetz and Swaminathan, 2006; Haltiwanger et al, 2010). A counterargument is that big boxes, by means of attracting consumers to the area, have a positive effect on local firms because of the demand spillovers that come from an increased inflow of consumers (Haltiwanger, 2010).

While many countries (e.g., the U.K. and Belgium) have regulations that may inhibit the entry of large-scale retailers, the Swedish market is less restricted in regard to retail-entry regulations (OECD. Stat, 2013). The Swedish Plan and Building Act (PBA) from 1987 allows the country's 290 municipalities to decide on matters such as retail zoning laws for themselves (Boverket, 2019).

From a theoretical point of view, the expected effects of the entry of a big box such as IKEA on incumbent retailers depends on what type of goods or services the latter provide and where they are located in relation to the new IKEA store. In retail and the service industry, colocation is motivated by the positive externalities that arise from demand spillovers in the form of comparison shopping and multipurpose shopping (Mulligan et al, 2012). Multipurpose shopping (Mulligan, 1983; Ghosh, 1986; Thill, 1992) creates benefits for firms that sell dissimilar goods and services through the mechanism of consumers wanting to minimize transportation costs and therefore doing all their shopping in one place. These benefits apply to firms that are selling unrelated products as well as firms selling complementary products. Comparison shopping (Nelson, 1970; Eaton and Lipsey, 1979) benefits firms that sell products that are similar or imperfect substitutes, due to consumers' desire to minimize both transportation costs and uncertainty.

A counteracting force that discourages colocation is the increased competition over the stock of consumer demand. Thereby, the intensity of the competition increases the more similar the collocated firms' products are (Baum & Mezas, 1992).

Given that the entry of a big box may be interpreted as a substantial increase in the size of a cluster of firms, the expected effects on incumbents may be either positive or negative. Specifically, firms that sell dissimilar products to those of IKEA, noncompetitors, may expect to benefit from demand spillovers due to multipurpose

shopping, while firms that sell similar products to IKEA may experience both the positive effects of demand spillovers from comparison shopping and negative effects due to increased competition. The net effect on an incumbent firm may therefore be argued to depend on the degree of product overlap between the incumbent and the big box entrant (Zhu et al 2011).

As demand spillovers depend on spatial proximity (Rosenthal & Strange, 2003), they may be expected to be limited to firms in the nearby area. However, due to the competition between rivaling retail clusters, the negative effects of competition may occur over a larger area. Huff (1964) and Fotheringham (1983) show that the tendency of consumers to patronize one shopping destination is negatively related to the attractiveness of competing shopping destinations. Hence, a local cluster's attractiveness will increase when a big box enters, but it may be at the expense of firms in other clusters in the market area. Thus, outside the cluster with the big box entrant, both types of firms—those competing with and those not competing with IKEA—may be expected to experience negative effects of increased competition. Due to distance decay in demand, as stated in central place theory (Christaller 1933; Loesch, 1964), the effect of the entry will eventually drop to zero.

There is a large body of empirical literature that examines the impact of big boxes on local economic activity. However, the majority of these studies focus on nondurable goods retailers, such as Walmart or Target (e.g., Stone, 1997; Basker 2005; Hicks 2008; Jia 2008; Zhu et al 2011). As indicated in CPT and found in the empirical literature (e.g., Larsson & Öner, 2014; Klaesson & Öner, 2015), higher-order goods, such as durable goods, have a wider market reach than that of nondurable goods. Consequently, the effects of entry of a big box such as IKEA may differ from the effects of a Walmart entry and thus need to be studied. Of the inferential studies that examine entry by durable goods big boxes (Daunfeldt et al 2017, Han et al 2018; Daunfeldt et al 2019a; Daunfeldt et al 2019b; Håkansson et al 2019), few examine the effects on firms active in the hospitality sector. The sole study that does so (Mihaescu and Rudholm, 2018) examines neither the effects on net turnover and employment of hospitality firms nor the effects on such firms outside the entry municipality's borders. As indicated by Daunfeldt et al (2017), the effects of an IKEA entry may even go beyond neighboring municipalities, suggesting that it is important not to limit the analysis by administrative boundaries.

It is of interest to examine the effects on firms in both retail and hospitality, as both industries are highly dependent on proximity to consumer demand and thereby tend to collocate to benefit from the synergistic effects between shopping and leisure activities among visitors (e.g. Timothy et al, 2015). Moreover, previous studies have found that retail trade plays an important role as an amenity (Öner, 2017; Daunfeldt et al, 2019b). Firms that thrive in amenity-rich areas, such as restaurants and accommodation firms, may therefore be affected by the entry of IKEA as well. By examining the effects of IKEA entry on net turnover and employment of firms in retail and hospitality in areas that extend beyond municipality borders, this study contributes important knowledge on how firms are affected by durable goods big box entries.

A difference-in-difference regression analysis is used to estimate the impact of IKEA entry on net turnover and number of employees of firms active in the retail, restaurant and accommodation sectors. The effect of IKEA entry is identified by using the fact that the distance to the nearest IKEA decreases for some firms when IKEA enters a market, while it does not change at all for other firms. The former is defined as the treatment group, and the latter is the control group. However, to account for the endogeneity that may arise from IKEA's process of choosing a location, the control group is identified using coarsened exact matching (CEM), which reduces the imbalance between the treatment- and control group. To capture the nonlinear effect over distance, dummy variables for different distance zones are included.

The results show that IKEA entry increases net turnover for retail firms that sell goods not marketed by IKEA and that are located between 0 and 2 km (+21%) and 5 and 10 km (+19%) from the IKEA. Firms in the accommodation sector located between 25 and 50 km from the new IKEA also experience an increase in net turnover (+20%). No robust effects are estimated for substitute retail firms, restaurants, or firms in the affected city centers. The results suggest that IKEA entry creates demand spillovers through multipurpose shopping near the IKEA, and among retailers located between 5 to 10 km away. The results also suggest that firms in city centers have a certain resilience to competition of out-of-town shopping clusters. The increase in net turnover for accommodation firms indicates that entry by IKEA also has a positive effect on the region's destination attractiveness.

Section 2 below will present the theoretical framework and previous studies. In sections 3 and 4, the data and method are introduced. In section 5, the empirical results are presented and interpreted. Section 6 discusses and concludes the paper.

2. Theoretical framework and previous studies

While the effects of nondurable goods big boxes, for instance Walmart, have been well researched since the 1990s (e.g., Stone 1997; Davidson and Rummel, 2000; Basker 2005; Zhu et al., 2011 and Artz and Stone 2012 to name just a few), the effects of durable goods retailers such as IKEA are less well known. The effects when a durable goods big box retailer enters a local market may differ because consumer behavior is different for durable goods than for nondurable goods. In central place theory (Christaller, 1933; Loesch, 1964) it is stated that the consumer's willingness to travel to obtain a good is a negative function of distance. At a certain distance, termed the range, the willingness to travel will drop to zero. The range tends to be larger for infrequently purchased and more expensive products, compared to more frequently purchased products of lower price. The former is termed higher order goods and can be for instance furniture and the latter, termed lower order goods, may for instance be groceries. This has support also in empirical literature. Ray (1976), for instance, found that consumers were willing to travel greater distances for optical services which is a higher order good, than for groceries which is a lower order good. In studies of retailers' market reach it is also found that higher order goods retailers depend on a larger market area compared to lower order goods (e.g., Larsson & Öner, 2014; Klaesson & Öner, 2015). Therefore, the effect of the entry of a higher order goods big box is expected to influence a larger area compared to a lower order goods big box.

The expected effects of a big box entry on incumbent firms in the local area may be derived from the theories on agglomeration spillovers and competition. There are both positive and negative effects of collocation. Deriving their arguments from the agglomeration theories of Marshall (1890) and Jacobs (1969), Duranton and Puga (2004) formulate three sources of positive externalities: learning, sharing and matching. Learning occurs through knowledge spillovers among firms in the same or different sectors. Sharing arises due to access to indivisibles such as production facilities, and matching arises from the improved matches between firms and inputs such as workers, intermediate goods and buyers (Duranton & Puga, 2004). For retail

and service firms, positive externalities in the form of demand spillovers are of particular importance (Mulligan et al 2012). Demand spillovers from multipurpose shopping arise when consumers minimize transportation costs by shopping for different products in one location (Mulligan, 1983; Ghosh, 1986; Thill, 1992). This benefits firms that sell unrelated or complementary products. Demand spillovers from comparison shopping arise when consumers minimize both transportation costs and uncertainty by shopping at a single location for one specific product, hence benefiting firms that sell products that are similar or imperfect substitutes (Eaton & Lipsey 1979; Wolinsky 1983; Findlay 2002; Fujita & Thisse 2013).

The tendency to cluster is to some extent counteracted by the negative externalities of colocation. These negative externalities arise from the increasing costs of land and wages (Krugman, 1996). However, by collocating, competition over consumer demand also increases. Models of localized competition claim that the intensity of competition between firms is a function of the similarity in input resources. Thus, the more similar are their inputs, the higher is the degree of competition among firms (Hannan & Freeman, 1977). Clustering of firms that have a similar customer base leads to an increase in competition over this demand. Hence, the more similar firms' goods and services are to one another, the more these firms suffer from the negative effects of competition (Baum & Mezias, 1992; Nilsson, 2016).

Demand spillovers are highly dependent on physical proximity (Rosenthal & Strange, 2003), and as distance from a cluster increases, these spillovers decline rapidly. Due to distance decay in demand, the negative effects of competition also decline, albeit at a slower rate due to the competition that also exists between central places. In retail gravity models such as Huff's (1964) probabilistic model of competing central places or Fotheringham's (1983) model of competing destinations, the attractiveness of one place has a negative influence on the attractiveness of competing places. For instance, in Huff's (1964) model, the probability of a consumer choosing a specific destination to shop at is negatively affected by the size of other retail clusters. Competition effects may therefore also exist among clusters that are located within reach of the customer, that is, within the same market area. As distance increases between retail clusters, the effects of competition decline and eventually die out.

If one views the entry of a big box as an increase in the size of a cluster of firms, the effects of an entrant may be predicted from the theories outlined above. Thus, the effects of a big box entry within the cluster can be expected to be positive for firms that

sell goods and services that are not sold by the big box due to the entrant generating demand spillovers from multipurpose shopping and/or functioning as a complement to existing retailers. Firms that sell similar goods and services to those of the big box entrant may be both positively and negatively affected, with the net impact depending on which effect dominates—the positive effects from comparison shopping or the negative effects from increased competition. Outside the local cluster of firms, the effect may be expected to be negative for both types of firms, and at some distance, the effect drops to zero.

The effects that are predicted by theory are in some cases also confirmed by empirical findings. Previous firm-level studies of durable goods big box entry find mixed effects in the vicinity of the entry site. Hernandez (2003) descriptive study that examines the effect of Home Depot's entry in the Toronto area between 1995 and 2001, finds indications that smaller firms in general declined in number following this retailer's entry. In Han et al (2018), the effect of IKEA entry on incumbent firms' productivity in local municipalities is investigated. Retail firms are separated based on whether they provide complementary or substitute retail goods. The authors find that retailers selling substitutes are not affected at all, while the productivity of complementary goods retailers was positively affected, increasing by 35% in the municipality of entry. In Mihaescu and Rudholm (2018), the effect of IKEA entry on the productivity of restaurants and accommodation firms in four Swedish municipalities in the mid-2000s is examined. A negative effect on firms' productivity following IKEA entry is found. With a majority of the firms in that study being restaurants, the authors suggest that the results are driven by the increased competition from the in-store IKEA restaurant.

Previous studies have also found indications that there is distance decay in the positive as well as negative externalities of a new IKEA store. In Daunfeldt et al (2019a), the effects of IKEA entry on retail firms in three Swedish municipalities are examined. They find positive effects of 43% on retail revenues within 0.5 km of the entry location, but these effects decrease to 7% within 1 km. The authors moreover find an increase of 34% in revenue among incumbent firms selling complementary products to those of IKEA within 0.5 km but increases of only 12% for firms at 1 km, 5% for those at 2 km and 2% for those at 5 km. However, the effects of IKEA entry are negative for firms selling substitute goods: -32% and -23% for firms located at 2 and 5 km, respectively. The authors find no effect on incumbent retailer revenues in the city centers or any

effects on the number of employees. As noted by Daunfeldt et al (2017), the effects when IKEA enters a local market may also reach neighboring municipalities. These authors' results show that while aggregate revenues and employment increase in the durable goods trade by 20% and 17%, respectively, in the entry municipality, there is a small, albeit significant, decline in durable goods employment in neighboring municipalities.

Previous studies thus indicate that there are extensive effects on incumbent retailers when a big box durable goods retailer enters a local market. However, many of the previous studies are descriptive (Jones & Doucet, 2000; Hernandez, 2003) or examine mainly the North American market (for instance, Haltiwanger 2010). The studies set outside the North American market (e.g., Daunfeldt et al 2017; Han et al 2018) tend to focus on the effects at a highly aggregated level, such as the municipality level. The study that is most similar to the present paper is that of Daunfeldt et al (2019a), which also examines the effect of IKEA entry on retail sales and employment and how the effect varies with distance to the new IKEA store. However, they do not investigate the effects of IKEA entry on firms outside the municipality borders. In addition, effects on firms in related sectors, such as restaurants and accommodation firms, are not examined, which previous studies (Mihaescu & Rudholm, 2018) have found to be influenced by IKEA entry in terms of productivity. As IKEA also hosts a bistro and a restaurant, which together with its food retail in Sweden constitutes 5.5% of its annual turnover (IKEA, 2018), it also poses competition to other restaurants.

3. Data

Firm- and establishment-level data for the period 2000 and 2015 is obtained from Statistics Sweden and include detailed information such as location coordinates and financial data. Using the coordinates for all existing IKEA establishments in Sweden during the period, the distance from each incumbent firm to the nearest IKEA is measured year by year. One limitation with the data is the resolution of the coordinates which, due to confidentiality, are restricted to a precision of squares of 1*1 km in rural areas and 250*250 meters in urban areas. This means that the precision may vary by approximately 1.4 km off the true location in rural areas and 350 meters off the true location in urban areas (1.4 km and 350 m are the hypotenuse of each of the squares). Another limitation is that net turnover is specified only at the firm level and thus the

analysis is limited to firms with a single plant. This reduces the size of the dataset by 20% to a total of 800,000 firm-year observations. However, since firms that are not part of a chain are more sensitive to local conditions, these are most policy relevant to study. Due to their ownership structure this means that franchise firms are included, but they are not possible to identify. Franchise firms and independent firms share more similarities than differences, however. Since franchise firms carry both the costs and most of the risk of investments, they are, in similarity with the independent firms, reliant on the local circumstances, and are therefore of most policy relevance to study. Firms that move during the period or have incomplete location data are also dropped, which further reduces the dataset to 608,000 observations.

Firms with industry codes for ambulatory activities are excluded, as they do not have a permanent location. Firms with industry codes indicating that they have solely mail-order or internet-based sales are also excluded, as these firms usually do not operate from physical stores. There is a possibility that some of these are retailers with showrooms, in which case they are dependent on proximity to consumers. However, as it is not possible to discern whether a firm sells through showrooms or solely through online platforms, these firms are excluded.

At the beginning of the study period, IKEA had 15 stores in Sweden. IKEA opened six new stores during the study period: one in 2004 (Gothenburg), two in 2006 (Kalmar and Haparanda), one in 2007 (Karlstad), and two in 2013 (Uddevalla and Borlänge) (see Figure 1). The store that opened in 2004 is excluded from the analysis on the grounds that it is located in Gothenburg, which is the second largest city in Sweden and already had one IKEA located in its metropolitan area. Therefore, this incidence of IKEA entry is very different from the others, which occurred in medium-sized towns previously lacking an IKEA in their vicinity. The two stores that opened in 2013 are also excluded to avoid the problem of multiple treatments. This means that the IKEA entries under study are those that occurred in 2006 and 2007, as indicated in the Figure 1.

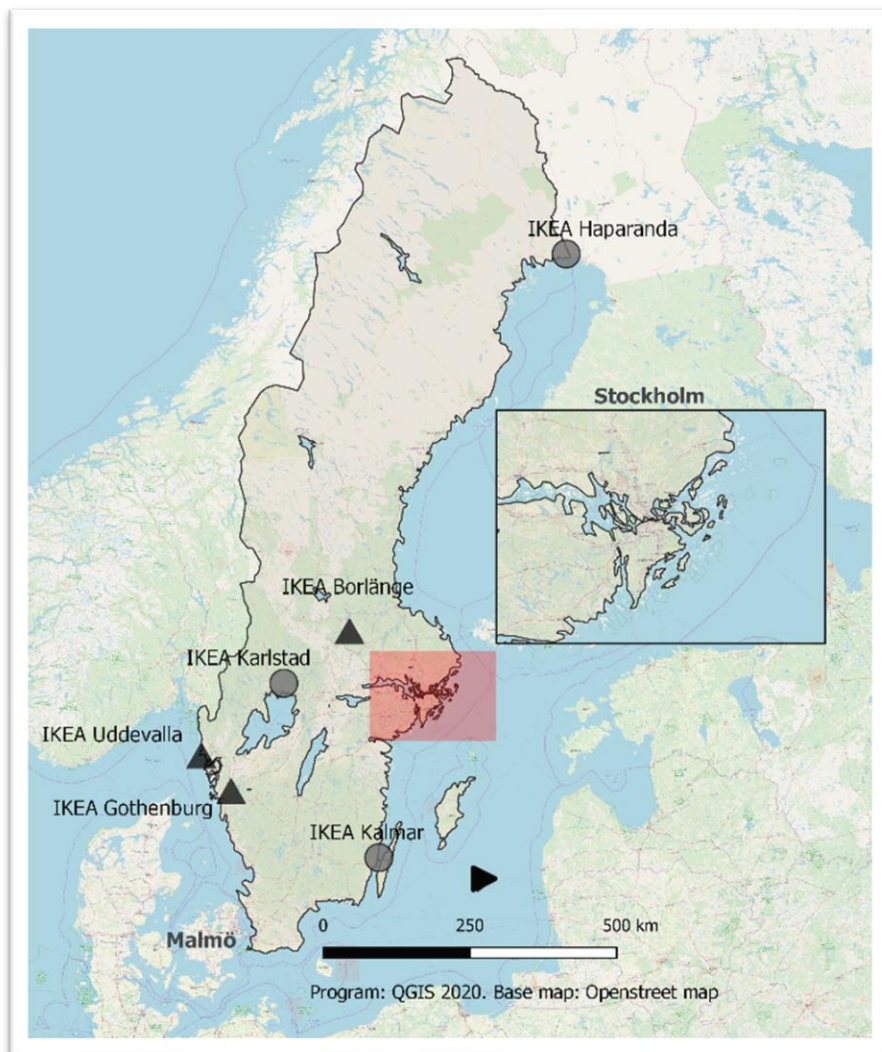


Figure 1. New IKEA locations 2000-2015. IKEA entries that are included in the analysis are indicated with a circle and those that are excluded with a triangle. Source: author. Background map: OpenStreetMap. Program: QGIS.

Once a new IKEA opens a store in an area, the distance to the nearest IKEA for some firms decreases, and for others, it remains unchanged. Firms that experience a distance decrease are defined as the treated firms. Firms that do not experience such a change in distance are used as the control group. Moreover, only firms that were affected by the 2006 and 2007 IKEA entries are included in the treatment group. Firms that experienced a change in distance to the nearest IKEA due to the 2004 entry of IKEA in Gothenburg are dropped. This produces an unbalanced panel of firms covering the period between 2000 and 2015 and involving approximately 550,000 observations and

150,000 firms. Variable descriptions and descriptive statistics of all the variables used in the analysis are available in Tables A1 and A2 in the appendix.

In this study, the firms that are studied are from two sectors: retail and hospitality. The Swedish Standard Industrial Classification codes (SIC) that are used to differentiate within-sector activities correspond to the European NACE codes. The SIC codes used in the analysis are reported in Table A3 in the appendix. Statistics Sweden changed the specifications regarding SIC codes twice during the study period: 2002 and 2007. The change from 1992 codes and 2002 was minor, while the change in 2007 was more comprehensive and involved a more detailed refinement of the existing categories. Due to the nature of the last change, the SIC codes for 2007 and the 1992 definitions are translated into the categories that were used in 2002.

In line with Han et al (2018) and Daunfeldt et al (2019a), the retail firms in this study are separated by whether they sell similar or dissimilar goods to those of IKEA. Firms selling similar but not necessarily identical goods to those sold by IKEA are referred to as retailers of substitute goods (e.g., furniture, kitchen wares, textiles, lightning equipment; see more in Table A4). Since the data available do not have detailed information on the brand or price of goods sold, it is not possible to distinguish the degree of either vertical or horizontal differentiation between goods that are sold by firms with the same industry code. Therefore, the firms that are termed substitutes are firms that compete for consumer's money. Firms that sell dissimilar goods to those of IKEA are referred to as retailers of complement goods. These may be complements where the cross-price elasticity of demand is negative, or unrelated goods.

4. Method

4.1 Impact evaluation

The choice of location for an IKEA store is not a random process. This implies that the characteristics of incumbent firms that experience an IKEA entry may be different from those of firms not affected by an IKEA entry. This heterogeneity must be taken into account when one compares the treated firms with the control firms, as otherwise the estimates of the effect of IKEA entry will be biased. This creates an imbalance between the treated and control groups that is analogous to selection bias, and a matching method is therefore used to reduce this imbalance. The purpose with all matching methods is to improve the balance between the treated and the control group

so that the covariates have similar empirical distributions. This reduces model dependence and hence the statistical bias in the estimates. By matching on observed characteristics, the bias that stems from the heterogeneity between the control group and treated group is reduced. To use a matching method is hence an improvement over merely including the covariates in the regression analysis.

The matching method used here is coarsened exact matching (CEM). The benefits of using CEM over the more commonly used propensity score matching (PSM) (e.g. Rosenbaum & Rubin, 1983) are that the former requires fewer assumptions than the latter (Blackwell et al, 2009), which decreases the model dependence. Moreover, PSM has been found to increase the imbalance between the treatment group and the control group, which increases inefficiency as well as bias in the estimates. Last, CEM is more appropriate than PSM for matching that involves both continuous and binary variables (King & Nielsen, 2016), which is the case in the present study.

When a matching approach is used, it is assumed that, conditional on a set of variables, there are no unobserved differences between the control group and treatment group. Therefore, it is necessary to match variables that can reasonably be linked to the treatment assignment and the outcome variable (Rubin et al 1996). The CEM algorithm was developed for STATA by Blackwell et al (2009) and is performed by matching on a number of variables measured before the treatment occurred. The CEM algorithm coarsens the data and assigns units with similar values to strata or groups (Blackwell et al, 2009). In this study, a one-to-one matching algorithm is used instead of weights. This procedure generates a control group that is of equal size to the treatment group. The benefits of one-to-one matching are that it makes it possible to examine the trends of the dependent variables in the treatment group and the control group to verify that the pretreatment trends are parallel.

For each of the two dependent variables, net turnover and employment, a matching procedure was followed. The IKEA entries that are studied in this paper occurred in 2006 and 2007, and as matching should be conducted on pretreatment observations, firms are matched on characteristics observable in the year before.

The following variables are used in the matching: (i) Wage sums in the labor market region (*Wage sums_{t-1}*). This variable is assumed to be linked to the treatment assignment decision, as this variable captures the size of the local potential market, which may influence the decision to enter the area. (ii) The Euclidean distance to the nearest IKEA (*Dist. to IKEA_{t-1}*). This variable is also assumed to be linked to the

treatment assignment, as IKEA may take previous locations into account when choosing its store locations to avoid cannibalization. (iii) A dummy variable equal to 1 if a firm is under 5 years of age in the time before treatment (*Below 5 years_{t-1}*). This variable is included because studies have found that firm mortality decreases drastically after years 0-4 (e.g, Bhattacharya et al., 2015), and hence this is linked to the outcome variable. (iv) A dummy denoting the industry code (here the 3-digit SIC code, *SIC code*). This is included to accommodate the fact that different sectors have different growth trends, which may otherwise drive the results. (v) Firms' net turnover (*Net turnover_{t-1}*) and number of employees (*Employees_{t-1}*). Previous literature suggests that firm growth is not independent of firm size (see Sutton, 1997, for an overview); hence, variables that capture firm size are also included to ensure that the results are not driven by initial differences in organizational size. For the model where the response variable is the number of employees, net turnover is used. For the model where net turnover is examined, the number of employees is used, as it is not advisable to include an outcome variable in coarsened exact matching (Blackwell et al, 2010). (vi) The year before treatment (*year_{t-1}*). This accounts for the time of treatment by indicating the year before the treatment took place.

Matching results for the initial analysis, where all firms are included in the same analysis, are presented in Table 1. For each subsequent subsample analysis, the matching procedure is redone but not reported here and is available upon request.

Table 1. Imbalance measurement, univariate balance before and after matching, for all firms combined.

For the model on: Net turnover				
Before matching		After matching		
Multivariate L1 distance: 0.996		0.770		
	L1	Mean	L1	Mean
Wage sums _{t-1}	0.615	-1.3e+11	0.310	1.0e+09
Dist. to IKEA _{t-1}	0.844	168.03	0.236	5.074
Employees _{t-1}	0.125	0.493	0.109	0.656
Below5 years _{t-1}	0.126	-0.126	0	0
SIC code	0.129	-2.108	0	0
Year _{t-1}	0.880	-2.492	0	0
		0	1	
Matching summary:	All	513020	3409	
No. of strata: 6792	Matched	2691	2691	
No. of matched strata:	Unmatched	510329	718	
236				
For the model on: Employment				
Before matching		After matching		
Multivariate L1 distance: 0.995		0.828		
	L1	Mean	L1	Mean
Wage sums _{t-1}	0.598	-1.3e+11	0.415	7.7e+08
Dist. to IKEA _{t-1}	0.840	166.87	0.299	5.033
Net turnover _{t-1}	0.097	47.121	0.074	958.87
Below5 years _{t-1}	0.1303	-.1303	0	0
SIC code	0.133	-2.129	0	0
Year _{t-1}	0.879	-2.609	0	0
		0	1	
Matching summary:	All	442547	2964	
No. of strata: 4973	Matched	2314	2314	
No. of matched strata:	Unmatched	440233	650	
219				

As a comprehensive measure of overall imbalance between the control and treatment groups, the L1 statistic is used. A value of 0 indicates a perfect balance, and 1 indicates a perfect imbalance, meaning that the two groups are entirely separated. The magnitude of the change in each variable's L1 statistic is of lesser importance. What matters is the direction of the change, which should be negative. A decrease in L1 values indicates that the imbalances have improved and that the matched control group is a better alternative than the unmatched group. As seen when the imbalances before and after matching are compared, the balances improved for all the variables. The measure of most importance, however, is the overall imbalance measure, the L1-statistic, as it takes the joint distributions into account. Hence, even if some of the variables do not show a decrease in their individual L1 statistics, this is not a problem if the overall L1 statistic is reduced. As shown in Table 2, the overall imbalance between the two matched groups decreases after both matching procedures (see numbers in bold). This decrease in imbalance is an indication that the matched control group is more similar to the treatment group—and therefore more appropriate for statistical comparison—than the unmatched control group (Iacus et al 2008; Blackwell et al 2009).

4.2 Modeling nonlinearity

To model the effect of a decrease in distance, a difference-in-difference regression model is used. To account for the variation of the effects at different distances, the difference-in-difference indicator enters as a categorical variable. Once a firm is treated, i.e., experiences a decrease in the distance to the nearest IKEA, the treatment variable switches from zero to one for the relevant distance category. These different categories represent the posttreatment distances within a number of intervals: 0-2 km, 2-5 km, 5-10 km, 10-25 km, 25-50 km, 50-100 km and over 100 km. The distance categories are set to be as narrow as possible while at the same time ensuring that each distance category has at least 30 unique posttreatment firm observations. In the subsamples, where there are fewer observations, the distance dummies are increased in width. To avoid issues with multicollinearity, the number of categories must not be too large, however. The resulting number and width of the categories is therefore a tradeoff between preserving a minimum number of observations and reducing multicollinearity. Close to the IKEA entry site, the distance dummies are narrower than

those at longer distances. This is done to capture the negative but decreasing relationship between demand and transportation costs. Thus, the different distance dummies captures a nonparametric distance decay in demand that resembles a negative exponential function. The latter is often used to estimate the market potential of retail functions (e.g. Klaesson & Öner, 2014).

To estimate the effect of a decrease in distance, the following difference-in-difference model with two-way fixed effects (FE) is estimated:

$$Y_{it} = \alpha_0 + \Theta TG_i + \beta_1 DiD.Dists0 - 2km_{it} + \dots + \beta_k DiD.Dists100km_{it} + \mathbf{IX} + year_t + a_i + \varepsilon_{it} \quad (1)$$

where Y_{it} is the natural log of net turnover ($\ln Net. turn_{it}$) of firm i at time t and the number of employees ($\ln Empl_{it}$) of firm i at time t . TG_i is a dummy equal to 1 if a firm belongs to the treatment group and 0 otherwise. The difference-in-difference variable enters as a categorical variable in five categories: $DiD.Dists0 - 2km_{it}$; $DiD.Dists2 - 5km_{it}$ and so on. The category $DiD.Dists0 - 2km_{it}$ is equal to 1 if the firm is in the treatment group (if it ended up closer to an IKEA) and ended up between 0 to 2 km from the new IKEA and the time is after treatment, 0 otherwise. Similarly, $DiD.Dists2 - 5km_{it}$ is equal to 1 if the firm is in the treatment group and becomes located between 2-5 km from the new IKEA and the time is after treatment, 0 otherwise, and so forth for the remaining distance variables. Based on theories of demand spillovers (Eaton & Lipsey, 1979; Thill, 1992) and previous studies (Han et al, 2018), the effect on firms near the entry site (at 0-2 km or 2-5 km) is expected to be positive for firms that sell dissimilar goods or services to those of IKEA. In the present study, these include complement retail firms and accommodation firms. In the same area, the effects on substitute retail firms are expected to be negative, in line with the theories of locational competition (e.g. Hannan & Freeman 1977) and previous studies (Baum & Mezes, 1992; Nilsson, 2016). However, due to demand spillovers from comparison shopping, the effects may also be positive.

Regarding restaurants, the expected effects may be negative since they can be seen as substitutes for the IKEA restaurant. However, these firms may also benefit from demand spillovers through a mechanism similar to that of retailers of substitute goods. As the distance increases to between 5-10, 10-25, and 25-50 km, the effect of IKEA entry is expected to be negative for both types of firms. This prediction is in line with

the theories on competition in central places and competing destinations (Huff, 1964; Fotheringham, 1983). Due to distance decay in demand, as modeled in central place theory (Christaller, 1933 & Loesch, 1964), the effect is expected to decline with increasing distance and eventually drop to zero. At distances of 50-100 km and over 100 km, the effects are therefore expected to go to zero.

\mathbf{X} is a vector of additional control variables included in the matching procedure: First is a dummy equal to 1 if a firm is younger than 5 years (*Below5yearsold_{it}*) at time t and 0 otherwise. This variable is expected to have a negative effect, as previous studies have found that firm mortality is larger during the first four years (Bhattacharya et al., 2015). Next are the wage sums (*Wage.sums_{rt}*). This variable is expected to have a positive effect on the outcome variables, as it captures potential demand in the regional market. Distance to IKEA prior to the treatment (*Dist.to IKEA_{t-1}*) and the SIC code dummy (*SIC code*)¹ are time invariant and will therefore be omitted from the fixed effects estimation.

The size variables included in the matching procedure (employees for the matching for the net-turnover regression, and vice versa) are not included in the regression, as these are highly correlated with the outcome variables. θ is the coefficient of the treatment group dummy, however as treatment group is a time invariant variable it will not be estimated in the fixed effects estimation. α_0 is a common intercept and β_1 to β_k are coefficients of the distance dummies and $\mathbf{\Pi}$ is a vector of the coefficients to be estimated. Finally, there are time (*year_t*) and individual firm (*a_i*) fixed effects components. The model is estimated as a fixed effects model with heteroscedasticity- and autocorrelation- robust standard errors (White, 1980; Newey & West, 1987). The explanatory variables are overall expected to have a similar effect on both employment and net turnover, as they are both indicators of organizational growth but capture different dimensions. Growth in net turnover captures performance in the market, while growth in the number of employees shows growth in internal resources (Delmar et al, 2003; Daunfeldt et al, 2015). However, the indicators are not synonymous with each other, as an increase in net turnover does not necessarily translate into more employees. Firms may instead choose to invest the surplus in capital instead (Wiklund,

¹ Some firms do change SIC code and thus there is some variation in this variable. However, these are very few and not of interest for the study, thus they are not reported.

1999); hence, the effect on employment may be less pronounced than that on net turnover.

One of the arguments against out-of-town retail entries is that city centers are negatively affected (Wrigley & Lambiri, 2014). The effect of IKEA entry on incumbent firms located in city centers is therefore also examined. Using the definitions of city centers specified in CityIndex (HUI Research AB & Agora, 2018) together with the coordinates of firms, all firms located in city centers could be identified. The data from Statistics Sweden have as their lowest level of resolution the firm coordinates to 250*250 meters in urban areas, and all coordinates within a grid square are reported to be in the lower left corner. Therefore, as the true location may in fact be in the opposite corner, there is a risk that the true location is approximately 350 meters off; therefore, a 350 meter buffer zone is added to the borders of the city centers (the hypotenuse is exactly 354 meters).

The key identifying assumption of a causal effect of a treatment (e.g. Angrist & Pischke, 2009) is the common trends assumption, which states that in absence of treatment the counterfactual development of the treated would be the same as the trend of the controls. Following the approach in Pischke (2007), the common trends assumption is tested by plotting the development of net turnover and number of employees for the treated and the CEM control groups before and after treatment. The effect of IKEA entry is examined for subcategories of firms, and as each of these requires a separate CEM control group, the parallel trends assumption is tested for each subsample and is shown in Figures 2a and 2b for the full sample and in Figures A3a to A5h in the appendix.

In Figures 2a and 2b, the average values of the dependent variables of the treated (dashed line) and the control firms (solid line), using the CEM-matched control group, are shown for all the firms. The trends are parallel up to 2005, the last year before any of the treatments began (which was in 2006 and 2007). The trend of the control group also shifts after 2005. However, since treatment occurs at different times, matching is performed on observables at two different points in time (2005 and 2006); therefore, the curvature of the treatment group trend is also reflected in the control group. Employment and net turnover are higher in the beginning and in the end of the period, with a dip in the middle, around 2005 and 2006. The explanation behind this is that since the panel is not balanced, firms that existed at the time of matching, do not necessarily exist also in 2000 or 2015. This means that the number of firms were larger

in 2005/2006- where the dip in average net turnover/number of employees is seen in the graph. Firms that were alive in 2000 *and* 2005/2006 are likely to have a higher net turnover (since age and size are positively correlated e.g. Evans, 1987) than firms that existed only a few years before and after the time of treatment. The same holds for firms that existed in both 2015 *and* 2005/2006. Therefore, the average of net turnover/number of employees is higher in the beginning and the end of the period.

As shown in Figure 2a, until 2005, the treatment group has a higher average net turnover than the control group. In the period after the second treatment, after 2007, the treatment group firms have on average a lower net turnover than the control group. The same is true for the figure depicting employment.

The pretreatment trends are not parallel for some of the subsamples, however. These are complementary goods retailers employment (Figure A 4b), substitute goods retailers employment (Figure A 4d), accommodation net turnover and employment in the city center (Figures A 5g and A 5h). Therefore, in the next section, only the results of the subsets where the parallel pretrends assumption holds are discussed.

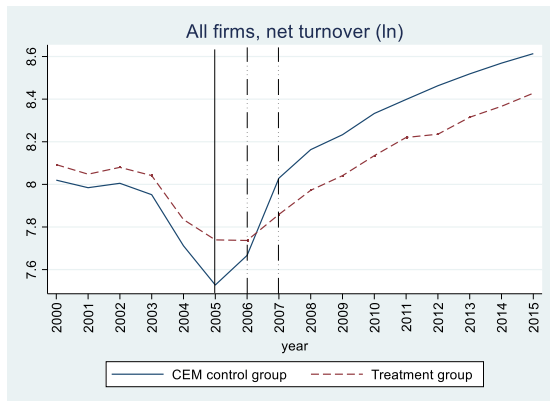


Figure 2a. All firms. Net turnover.

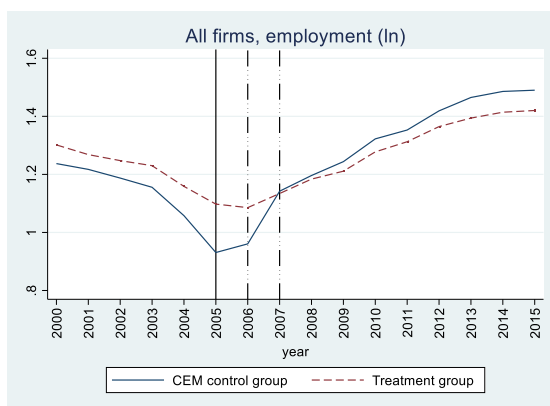


Figure 2b. All firms. Employment.

Figures 2a and 2b. The vertical line indicates the year before treatment, and the dashed lines indicate the times of treatment. The solid line is the control group and the dashed line is the treatment group.

5. Results

Table 2 presents the results from the analysis on all firms. I follow the approach of Card and Krueger's (1994) study that investigates minimum wage legislation and its effect on employment in the US. They include a state-specific trend to control for local growth trends that may otherwise drive their results. In a similar vein, I include municipality-specific time trends. The argument is that retail markets in different municipalities may experience different growth trends due to, for instance, zoning regulations (see, e.g., Maican & Orth, 2015). Since these regulations are determined at the municipality level, a municipality-specific time trend is included to ensure that the results are not merely driven by differences in local policies.

Table 2. Difference-in-difference regression. Fixed effects (FE). Dependent variables are log of net turnover and log of number of employees. Retail and hospitality firms. Estimations using CEM.

Variables	$\ln Net. turn_{it}$		$\ln Empl_{it}$	
TGDiD0_2 _{it}	0.118**	0.0715	0.0439	0.0166
	(0.0596)	(0.0640)	(0.0473)	(0.0515)
TGDiD2_5 _{it}	0.0254	-0.0264	0.0600**	0.0219
	(0.0278)	(0.0305)	(0.0259)	(0.0258)
TGDiD5_10 _{it}	0.166***	0.129**	0.0663	0.0239
	(0.0474)	(0.0519)	(0.0423)	(0.0466)
TGDiD10_25 _{it}	-0.0536	-0.0850	0.0399	-0.00107
	(0.0529)	(0.0616)	(0.0360)	(0.0387)
TGDiD25_50 _{it}	-0.0413	0.00761	-0.0277	0.0174
	(0.0276)	(0.0269)	(0.0220)	(0.0238)
TGDiD50_100 _{it}	0.0140	-0.0149	0.0231	0.00578
	(0.0182)	(0.0181)	(0.0160)	(0.0158)
TGDiD100- _{it}	0.0438	0.0580**	0.0468**	0.0595***
	(0.0277)	(0.0287)	(0.0231)	(0.0226)
Wage sums _{rt}	0.216	0.264	0.369***	0.0895
	(0.169)	(0.175)	(0.132)	(0.145)
Below 5 year _{it}	-0.0761***	-0.0735***	-0.0943***	-
	(0.0133)	(0.0131)	(0.0112)	0.0935***
Constant	3.705	1.458	-7.082**	6.502
	(3.780)	(53.72)	(2.952)	(62.45)
Municip.*Trend	N	Y	N	Y
Obs.	42,351	42,351	41,541	41,541
R ²	0.036	0.056	0.015	0.031
No. firms	4,849	4,849	4,363	4,363

***p<0.01, **p<0.05, *p<0.1 level of significance. Heteroscedasticity- and autocorrelation-robust standard errors reported in parentheses. Included but not reported: firm and time fixed effects and 3-digit SIC codes.

The results in Table 2 show that the effect of IKEA entry is positive for firms nearest the entry site, that is, at 0-2 km, and that IKEA increases the net turnover for incumbent firms by 11.8%. When adding the municipality-specific time trend, however, the effect is no longer significant. For firms between 5 and 10 km from the new store, there is a positive effect of IKEA entry on net turnover of 16.6%. After the

municipality-specific time trend is added, this effect drops somewhat in magnitude to 12.9%, but it remains positive and significant. Regarding employment, there is a positive effect on IKEA entry in the area for firms between 2-5 km from the entry site. This effect is, however, not robust to the inclusion of municipality-specific time trends. Beyond 100 km from the new IKEA, employment increases by 4.7%, which remains robust and of similar size to the inclusion of the municipality specific time trend. In Table 3 the data is divided into two subsectors: restaurants and accommodation firms.

Table 3: Fixed effects estimations of the IKEA effect on restaurants and accommodation. Dependent variables are log of net turnover and log of number of employees. Estimations using CEM.

Variables	Restaurants			
	lnNet. turn _{it}		lnEmpl _{it}	
TGDID0_3 _{it}	-0.147	-0.0488	0.0235	-0.0147
	(0.0975)	(0.104)	(0.0823)	(0.0722)
TGDID3_5 _{it}	0.0314	0.0851	0.0450	0.0454
	(0.0511)	(0.0634)	(0.0594)	(0.0594)
TGDID5_10 _{it}	0.0378	0.0204	-0.0164	0.0339
	(0.0599)	(0.0675)	(0.0923)	(0.0931)
TGDID10_25 _{it}	-0.190	-0.279*	-0.139	-0.0139
	(0.132)	(0.144)	(0.0941)	(0.106)
TGDID25_50 _{it}	-0.0665	-0.0689	0.0246	0.00869
	(0.0547)	(0.0630)	(0.0630)	(0.0577)
TGDID50_100 _{it}	0.0146	-0.0129	0.0217	0.0494
	(0.0392)	(0.0358)	(0.0397)	(0.0390)
TGDID100- _{it}	0.0106	0.121***	0.0839*	0.0286
	(0.0511)	(0.0407)	(0.0501)	(0.0545)
Wage.sums _{rt}	-0.0894***	0.385	-0.205	-0.0424*
	(0.0218)	(0.389)	(0.421)	(0.0251)
Below5 year _{it}	0.102	-0.0752***	-0.0299	0.0888
	(0.292)	(0.0213)	(0.0251)	(0.316)
Constant	5.561	-8.199	-0.480	-0.467
	(6.554)	(38.24)	(7.098)	(7.089)
Municip.*Trend	N	Y	N	Y
Obs.	9,176	9,176	8,925	8,925
R ²	0.123	0.180	0.085	0.027
No. firms	1,263	1,263	1,098	1,098

Table 3 continued.

Variables	Accommodation firms			
	lnNet. turn _{it}		lnEmpl _{it}	
<i>TGDID0_25_{it}</i>	0.109	-0.119	0.235***	0.0123
	(0.0720)	(0.0839)	(0.0886)	(0.0963)
<i>TGDID25_50_{it}</i>	0.202**	0.155*	-0.0580	-0.0698
	(0.0858)	(0.0833)	(0.0816)	(0.0856)
<i>TGDID50_100_{it}</i>	0.000629	-0.0407	0.0208	-0.00172
	(0.0577)	(0.0652)	(0.0788)	(0.0575)
<i>TGDID100_</i>	0.0342	0.0506	0.114	0.181**
	(0.0939)	(0.0948)	(0.0704)	(0.0700)
<i>Wage.sums_{rt}</i>	0.000444	1.364**	-	1.960***
	(0.0531)	(0.631)	0.00464	(0.567)
<i>Below5 year_{it}</i>	1.031*	0.00562	0.647	-0.0100
	(0.583)	(0.0472)	(0.399)	(0.0400)
Constant	-14.62	-90.30**	-12.54	22.04
	(12.87)	(35.86)	(8.809)	(86.09)
Municip.*Trend	N	Y	N	Y
Obs.	2,998	2,998	3,094	3,094
R ²	0.103	0.203	0.051	0.144
No. firms	362	362	341	341

***p<0.01, **p<0.05, *p<0.1 level of significance. Heteroscedasticity- and autocorrelation-robust standard errors reported in parentheses. Included but not reported: individual and time fixed effects and 3-digit SIC codes.

For the analysis in Table 3, the widths of the intervals for the distance dummies are expanded to preserve the number of posttreatment observations within each category. In the first column, the effects of IKEA entry on restaurants' net turnover are presented. In the area closest to the entry location, the effect is negative; when the distance increases, the effects grow more negative and culminate for restaurants between 10 and 25 km from the new store. The effects are not statistically significant, but the signs of the coefficients indicate that there is a weak negative effect on the net turnover of restaurants, even when the municipality-specific time trend is included. The effect on restaurants' employment does not show any similar pattern. The effect on accommodation firms' net turnover is insignificant in the area closest to the IKEA, between 0-25 km. In the next distance category, 25-50 km from the IKEA, the effect, a

20% increase, is positive and significant. When the municipality-specific trends are included, the effect decreases in magnitude to 15.5% but remains significant at the 10% level. Employment in accommodation increases by 23.5% at distances between 0-25 km from the IKEA. The effect is not robust to the inclusion of municipality-specific trends, however.

Table 4: Fixed effects estimations of the IKEA effect on different firms. Dependent variables are log of net turnover and log of number of employees. Estimations using CEM.

Variables	Complementary goods retailers			
	lnNet.turn _{it}		lnEmpl _{it}	
TGDID0_2 _{it}	0.210***	0.161**	0.0792	0.0514
	(0.0580)	(0.0654)	(0.0610)	(0.0665)
TGDID2_5 _{it}	0.000612	-0.0605	0.0382	0.00790
	(0.0366)	(0.0389)	(0.0316)	(0.0309)
TGDID5_10 _{it}	0.193***	0.194***	0.0515	0.0168
	(0.0680)	(0.0737)	(0.0468)	(0.0524)
TGDID10_25 _{it}	-0.0153	-0.0129	0.0604	0.0126
	(0.0648)	(0.0772)	(0.0395)	(0.0443)
TGDID25_50 _{it}	-0.0707**	-0.0122	-0.0178	0.0271
	(0.0332)	(0.0318)	(0.0258)	(0.0266)
TGDID50_100 _{it}	0.00452	-0.0290	0.0291	0.0118
	(0.0220)	(0.0229)	(0.0183)	(0.0177)
TGDID100- _{it}	0.0283	0.0355	0.0762***	0.0874***
	(0.0353)	(0.0404)	(0.0278)	(0.0266)
Wage sums _{rt}	-0.0536***	-0.112	-0.0985***	0.0879
	(0.0175)	(0.207)	(0.0135)	(0.175)
Below 5 year _{it}	-0.0237	-0.0592***	0.245	-0.0963***
	(0.207)	(0.0169)	(0.153)	(0.0136)
Constant	8.217*	35.44	-6.230*	96.57***
	(4.619)	(43.51)	(3.416)	(24.81)
Municip.*Trend	N	Y	N	Y
Obs.	27,655	27,655	26,997	26,997
R ²	0.028	0.062	0.016	0.042
No. firms	2,925	2,925	2,625	2,625

Table 4 continued.

Variables	Substitute goods retailers			
	$\ln Net. turn_{it}$		$\ln Empl_{it}$	
$TGDiD0_{15}_{it}$	-0.105	-0.194	0.0202	0.0195
	(0.0773)	(0.129)	(0.0533)	(0.0831)
$TGDiD15_{60}_{it}$	0.0140	0.127	-0.0482	0.0106
	(0.0955)	(0.111)	(0.0526)	(0.0618)
$TGDiD60_{100}_{it}$	0.0520	-0.0295	0.0114	-0.0812
	(0.0898)	(0.0755)	(0.0443)	(0.0621)
$TGDiD100_{-it}$	0.0444	0.0121	0.0205	-0.0440
	(0.100)	(0.0802)	(0.0461)	(0.103)
$Wage. sums_{rt}$	-0.0787	0.577	-0.0906***	0.166
	(0.0667)	(0.636)	(0.0133)	(0.597)
$Below5\ year_{it}$	0.387	-0.105	0.303*	-0.0668
	(0.518)	(0.0750)	(0.167)	(0.0436)
Constant	-1.042	-23.59	-0.332	-51.73
	(11.59)	(49.03)	(11.39)	(45.42)
Municip.*Trend	N	Y	N	Y
Obs.	2,181	2,181	2,143	2,143
R2	0.017	0.018	0.038	0.160
No. Firms	267	267	237	237

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ level of significance. Heteroscedasticity- and autocorrelation-robust standard errors reported in parentheses. Included but not reported: individual and time fixed effects and 3-digit SIC codes.

Incumbent retail firms selling complementary goods increase their net turnover by 21% in the area nearest the entry site of the new IKEA and this effect remains, albeit somewhat smaller, after inclusion of the municipality specific time trends. For firms between 5 and 10 km, the effect is still positive and significant but somewhat weaker at 19%. For firms between 25 and 50 km from the entry of the new IKEA, there is a negative effect of 7%. This effect disappears once the municipality trends are added, however. As regards the effects on employment, the results are not robust to the parallel trends assumption, however there are positive effects on employment at

distances beyond 100 km of 7.6%. Thus the effects found in Table 2 on all firms' employment may have been driven by retailers of complementary goods. When examining the effects on substitute retail net turnover, there appears to be no significant effects for any of the distance bands.

To examine the effects on incumbent firms located in city centers, the estimation is done anew, but now only for firms that experienced a decrease in distance from an IKEA and that are located in city centers. In Table 5, the results for firms located in the affected city centers are presented.

Table 5: Fixed effects estimations of the IKEA effect on firms in city centers. Dependent variables are log of net turnover and log of number of employees. Estimations using CEM.

Variables	Accommodation firms		Restaurants	
	$\ln Net. turn_{it}$	$\ln Empl_{it}$	$\ln Net. turn_{it}$	$\ln Empl_{it}$
$TGDiD_{it}$	0.0919 (0.0666)	0.0391 (0.0764)	0.188** (0.0834)	0.114 (0.0927)
$Wage. sums_{it}$	1.763* (0.883)	1.879 (1.198)	3.284** (1.369)	3.284** (1.364)
$Below5_{year_{it}}$	-0.218** (0.0873)	0.248** (0.112)	-0.209 (0.145)	-0.205 (0.145)
Constant	31.40 (20.14)	-6.737 (37.01)	-31.40 (20.14)	-72.61** (30.83)
Municip.*Trend	N	Y	N	Y
Obs.	627	627	716	716
R2	0.173	0.174	0.154	0.157
No. firms	53	53	59	59
			315	315
			315	262
			0.0681 (0.0453)	-0.103* (0.0596)
			1.987** (0.803)	0.0904 (0.513)
			-0.0458 (0.0412)	-0.0326 (0.0466)
			-6.509 (16.67)	-24.44 (74.77)
			2,399	2,329
			0.193	0.047
			262	262

Table 5 continued.

Variables	Substitute goods retailers		Complementary goods retailers					
	$\ln Net. turn_{it}$	$\ln Empl_{it}$	$\ln Net. turn_{it}$	$\ln Empl_{it}$				
$TGDiD_{it}$	0.0464 (0.0930)	0.101 (0.0702)	0.0930 (0.0811)	0.189** (0.0838)	0.0287 (0.0299)	-0.0460* (0.0273)	0.0348 (0.0258)	0.0244 (0.0240)
$Wage.sum_{r,t}$	-0.0929 (0.647)	-0.860 (1.127)	-0.411 (0.849)	-0.944 (1.225)	0.0637 (0.292)	0.615* (0.324)	0.592* (0.328)	0.370 (0.326)
$Below5 year_{it}$	-0.100 (0.0800)	-0.0601 (0.0978)	-0.135* (0.0795)	-0.0716 (0.0809)	-0.127*** (0.0283)	-0.125*** (0.0278)	-0.173*** (0.0262)	-0.165*** (0.0256)
Constant	10.10 (14.69)	71.49 (69.92)	10.40 (19.11)	10.09 (78.34)	6.296 (6.601)	-76.49 (47.30)	-12.44* (7.404)	87.24** (40.99)
Municip.*Trend	N	Y	N	Y	N	Y	N	Y
Obs.	736	736	824	824	7,890	7,890	7,855	7,855
R2	0.046	0.091	0.037	0.132	0.032	0.066	0.039	0.070
No. firms	93	93	85	85	784	784	728	728

***p<0.01, **p<0.05, *p<0.1 level of significance. Heteroscedasticity- and autocorrelation-robust standard errors reported in parentheses. Included but not reported: individual and time fixed effects and 3-digit SIC codes.

Restaurants in city centers are negatively affected by IKEA entry in terms of net turnover, -11.3% and employment, -10.3%; however, once municipality-specific trends are included, these effects become insignificant. The effects on substitute goods retailers in the city centers are insignificant for both net turnover and employment. The same also holds for net turnover and employment of complementary goods retailers.

The effects found on net turnover for complementary goods retailers at the distance of 5-10 km from the new IKEA do not appear to be explained by the development in the city centers. When the firms located between 5 and 10 km from the new IKEA is examined, the majority (approximately 60%) are found to sell durable goods (e.g., clothes, household appliances, electronic equipment, sports goods, spectacles), and close to all are located in an urban area (close to 90% of the firms). Of these firms, 31% are located outside the municipality of IKEA entry. Thus, they appear to be located in an urban area with both higher order and lower order goods retail.

The effects on employment of all firms (Table 2), found for firms at distances beyond 100 km were positive. These firms consist of 11% of accommodation firms, 26% restaurants, 20% grocery retailers and 44% durable goods retailers, and 80% of them are located in an urban area. The effects could not be explained by any of the subsamples, except that of complementary goods retailers. Due to the violation of the parallel trends assumption, it is not possible to determine if these effects are due to IKEA effect or due to the fact that the treatment group and control group had different pre-treatment trends.

6. Discussion and conclusion

The present study examines how the entry of a durable goods big box, IKEA, affects incumbent retail firms, accommodation firms and restaurants, and how these impacts vary with distance to the entrant. One of the motivations for firms in retail and consumer services to cluster is to access demand spillovers. However, these positive effects might be countered by the negative effects of increased competition over consumer demand. The net of these effects relates to how much of an overlap there is between the entrant and other firms in the cluster. Big box entry into a local market can be seen as a substantial increase in the size of a cluster, and therefore, such entries

offer an interesting opportunity to examine which of the theoretically hypothesized positive and negative effects dominate for different types of firms.

IKEA is of special interest to study since central place theory predicts that higher-order goods retailers require a larger market area than lower-order goods retailers. An IKEA entry might therefore affect firms in more distant consumer goods and services clusters. Firms that have an unrelated or complementary product assortment to that of IKEA might, on the one hand, benefit from the demand spillovers due to multipurpose shopping but, on the other hand, experience the negative effects of competition. Firms that sell similar goods might benefit from demand spillovers due to comparison shopping but also suffer the effects of increased competition.

Previous studies that have examined the effects of durable goods big box entry on firms in retail or related industries either have not examined the effects at the firm level or have not examined how the effect varies with distance to the new store. Studies that do take distance into account have neither included firms located outside the entry municipality nor examined related sectors. This study therefore contributes to the literature by studying the full spatial effect on incumbent retail firms while also including effects on firms in the related hospitality sector.

The analysis in this study focuses on the effect of IKEA entry on net turnover and employment of retail firms that sell substitute goods, retail firms that sell complementary goods, restaurants and accommodation firms. The results show that the entry of IKEA has a positive effect on net turnover for retailers of complementary goods that are located between 0-2 km (+21%) and 5-10 km (+19%) from the entry site, and on net turnover of accommodation firms (+20%) that are located 25-50 km from the entry site. No robust effects on substitute goods retailers, restaurants or on any of the firms located in nearby city centers are found. The same holds for employment.

The results suggest that IKEA entry results in positive spillover effects for retailers that sell complementary goods, supporting theories of multipurpose shopping (Mulligan, 1983; Ghosh, 1986; Thill, 1992). Complementary goods retailers located between 5-10 km see an increased net turnover as well, suggesting that the demand spillovers are not as sensitive to distance as often predicted. However, the reason behind this effect may be due to the characteristics of the firms located at these distances. Retail gravity models hypothesize that distance deterrence is weaker in more centralized nodes (Haynes & Fotheringham, 1984). According to CPT, places with both higher order goods and lower order can be considered as central places. As the firms

within the area of 5-10 km of the new store are mainly located in urban areas and sell both higher order goods and lower order goods, it is possible that these firms are located in centralized nodes. Therefore, a distance of 5-10 km may be close enough for retailers of complementary goods to benefit from the demand spillovers. This may also explain why there are no negative effects of IKEA found in the nearby city centers. The somewhat weaker positive effect for firms in the 5-10 km distance group suggests that there is distance decay in the effect of IKEA entry, which supports theories of distance decay in demand.

How do these effects compare to previous studies? In the study by Daunfeldt et al (2019a) it was found that retail complements within 2 km from the entry location increased their revenues by 5%. Thus, the effects in the present study which were +21% are of a much greater magnitude. One explanation may lie in the fact that the precision of the locational data used in this study is limited due to confidentiality. Thus, the true location of a firm may be up to 1.4 km off in rural areas and up to 350 m off in urban areas. This means that for a treated firm, the distance to the new IKEA is subject to a measurement error of up to 1.4 km. For firms that are recorded as being located within 1.5 km from the new IKEA, the true position may instead be 2.9 (1.4 km + 1.5 km) km from the new IKEA or 100 meters from the new IKEA (1.5 km - 1.4 km). This means that the relative magnitude of the measurement error is large for firms recorded as being located close to the new IKEA. Thus the difference between this study and that of Daunfeldt et al. may be due to limitations in the precision of the firm coordinates.

The effects of IKEA entry on firms in the hospitality sector are mixed, with positive effects on accommodation firms' net turnover and no effects at all on restaurants. The positive effect of IKEA entry on net turnover for the accommodation firms indicates that there may be an inflow of consumers from afar, implying that IKEA may contribute to the region's destination attractiveness. The literature on amenities, such as the study by Glaeser (2001), argues that consumption possibilities are important for place attractivity. In Daunfeldt et al (2019a) it was also found that IKEA increased the attractiveness of the entry municipality measured in house prices. The effects on accommodation net turnover in the present study may be thus be an effect of increased attractiveness of the region. When examining the municipalities that the affected firms between 25-50 km were located in, none of these were the IKEA entry municipalities. Thus, IKEA has a positive effect on the attractivity of the region at large.

While there are effects on net turnover of both complementary goods retailers and accommodation firms, there are no effects on employment. A possible explanation for this is that the number of employees changes slowly over time due to the rigidity on the Swedish labor market. Alternative explanations to the absence of effects on employment may be that changes in net turnover does not have to be translated into changes in employment. For instance, increases in the net turnover may be re-invested in capital stock or used to increase wages etc. instead of increasing the number of employees (see e.g., Wiklund, 1999). To examine the effects also on investments and wages would therefore be an interesting aspect to explore in future research.

The absence of significant effects on restaurants is puzzling. Previous findings of Mihaescu and Rudholm (2018) show that IKEA decreases the productivity of incumbent restaurants and accommodation in the municipalities of entry, which would indicate that other financial indicators should be affected as well. In their study, however, accommodation and restaurants were not separated in contrast to the present study, which limits the comparability between the two studies. The absence of effects on substitute goods retailers is also unexpected. In Daunfeldt et al (2019b), the effects on substitute goods retailers are found primarily in the area closest to the IKEA, namely, within 5 km. In the present study, the distance bands cannot be as narrow due to limitations with the sample size. Therefore, the lack of effects may be due to the too broad distance bands in the areas closest to the IKEA entry site.

The effects found on employment of firms located beyond 100 km from the new IKEA cannot be explained by any of the subsectors. However, the effects may be driven by complementary goods retailers as effects of similar direction and magnitude were found for these firms. Due to the violation of the parallel trends assumption, the results on complementary good retail firms' employment should be interpreted with caution, however. The types of firms located beyond 100 km are in general located in an urban milieu and consist of retail firms selling both higher and lower order goods. They also consist of restaurants and accommodation firms. Thus these firms may be located in centralized nodes. It is therefore possible that more remotely located centralized places in the region are positively affected by the increased attractiveness of the region. However, an increase in employment without an increase in net turnover is more difficult to explain. The increase in employment could, however, be due to anticipation effects, where firms increase their staff in expectation of an increase in sales.

Based on central place theory, the market area of a higher order goods big box retailer is assumed to be larger than the market area of a lower order goods retailer. This implies that the effect of a durables goods big box, such as IKEA, should be larger than that of a lower order goods retailer. How do the findings in the present study compare with those from studies of lower order goods retail big boxes? In Artz and Stone's (2012) study of Walmart entry in towns in Iowa it was found that retail categories that did not compete with Walmart increased their sales between 7 and 15% in the Walmart host towns. In the present study, where I define complementary goods retailers in an analogous manner, net turnover increased by 21% in the area closest to IKEA. Thus the effects by IKEA on similar types of firms (in the regard that they are complements) are larger in magnitude compared to those of Walmart. In Davidson and Rummel's (2000) study, also of Walmart but in Maine, neighboring towns within 15 miles (22 km) experienced changes in sales of between -2.9 to +4.5%, in the year after big box entry. In the present study, retail net turnover in urban areas increased by 19% between 5-10 km (which is within the 22 km in Davidson & Rummel's study) from the IKEA. Thus, within a distance that may be comparable with that of the towns that are neighbors to the Walmart town, IKEA had an effect on complements that is larger in magnitude than those that were found to be caused by Walmart. These comparisons suggest that IKEA attracts more consumers from a larger market area than Walmart which translates into larger effects on complement retail nearby IKEA and in the areas between 5-10 km.

To conclude, the present study finds effects that suggests that IKEA is beneficial for complementary goods retail both in the area nearby and in neighboring retail clusters. Moreover, the effects on accommodation suggests that IKEA increases the attractiveness which makes visitors come from afar. The positive effects on firms in accommodation were found on firms that were outside of the entry municipalities. Based on these findings, the positive effects appear not to be limited only to the entry municipalities, which should be taken into account by regional planners and local policymakers when considering the costs and benefits associated with similar establishments.

In future research, it would be interesting to examine the effects on firms in the hospitality sector within narrower distance bands in the area closest to the IKEA entry site. Another area for future research is to analyze the effects of durable goods big box entry on other sectors that are dependent on spatial proximity to consumers. These types of firms include, for instance, other parts of the hospitality sector, such as

museums and cinemas, and firms in the non-tradable service sector, such as hairdressers.

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Appendix

Table A1. Description of variables used in the regression analysis and the matching procedure.

Variables	Description
Net turnover	Net turnover in 1000 SEK
Employees	Number of employees in the firm.
Dist. to IKEA	Euclidean distance to the nearest IKEA in km.
Below 5 years	Dummy variable equal to 1 if firm at time t is under 5 years of age, 0 otherwise.
Year	Year dummy
Wage sums	Wage sums within aggregated on the local labor market region, in MSEK.
TG	Dummy equal to 1 if firm is in treatment group, 0 otherwise.
SIC code	3-digit industry classification code.

Table A2. Descriptive statistics of variables used in the regression analysis and in the matching procedure.

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
Ln (Net turnover)	471,338	7.631	1.534	0	17.195
Net turnover	476,251	7128.383	82667.980	-958	2.94E+07
Employees	549,185	4.835	10.390	1	743
Ln (Employees)	549,185	0.919	0.987	0	6.611
Dist. to IKEA	549,185	51.170	69.065	0.049	707.672
Below 5years old	549,185	0.581	0.493	0	1
Year	549,185	2007.804	4.603	2000	2015
Ln (Wage sums)	549,185	24.415	1.778	19.145	26.951
Wage sums	549,185	1.27e+11	1.56e+11	2.06e+08	5.07e+11
TG	549,185	0.066	0.248	0	1

Table A3. Retail and hospitality firms that are included in the analysis, by SIC code definitions in use in 2002

Retail		Hospitality	
Code	Definition of goods	Code	Definition of services
521	Nonspecialized goods	551	Hotels with and without restaurants
522	Foods, beverages and tobacco in specialized stores	552	Accommodation in the form of camping sites, hostels or other forms of short stay housing
523	Cosmetics, pharmaceutical and medical goods, and toilet articles	553	Restaurants
524	Specialized new goods	554	Bars
525	Used goods	555	Canteens

Source: Statistics Sweden

Table A4. Definition of substitute goods retailers.

Substitute goods retailers	
Code	Definition
52129	Nonspecialized retail
52410	Textiles
52441	Furniture
52442	Home furnishing textiles
52443	Kitchenware, porcelain and tableware
52444	Lighting equipment
52495	Wallpapers and rugs, carpets, etc.
52497	Office furniture

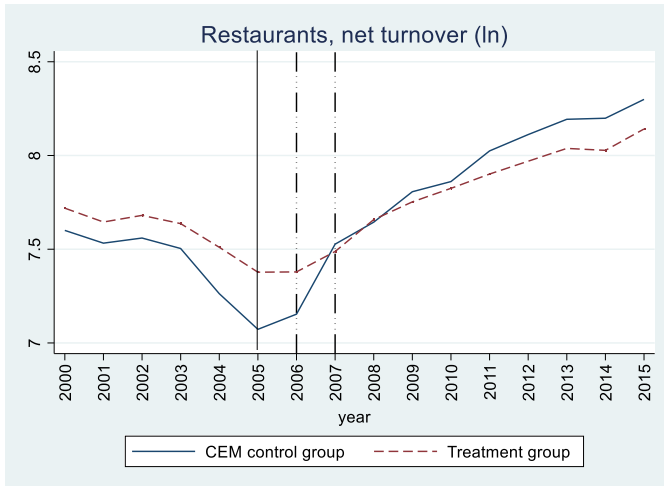


Figure A3a. Restaurants, net turnover.

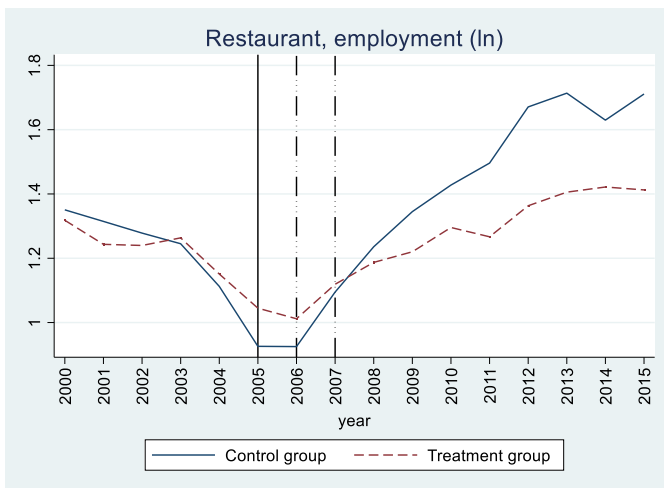


Figure A3b. Restaurants, employment.

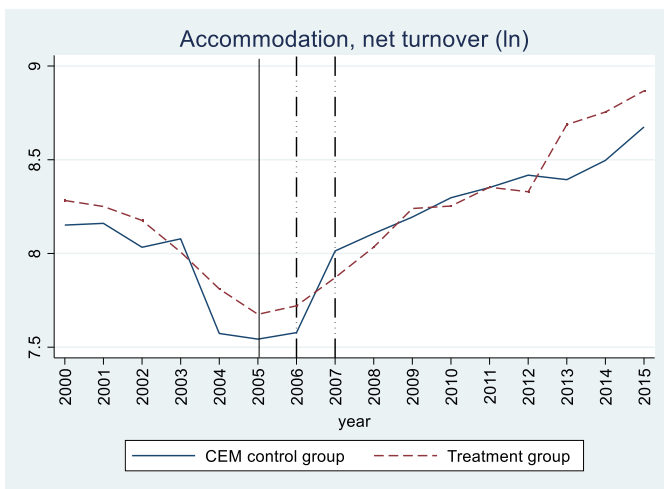


Figure A3c. Accommodation firms, net turnover.

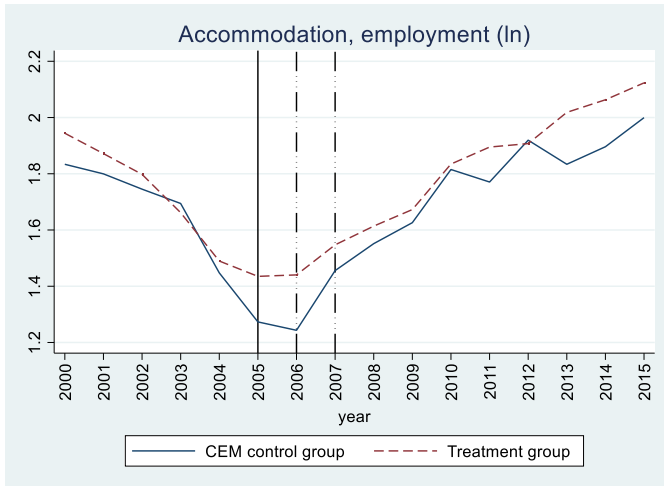


Figure A3d. Accommodation firms, employment.

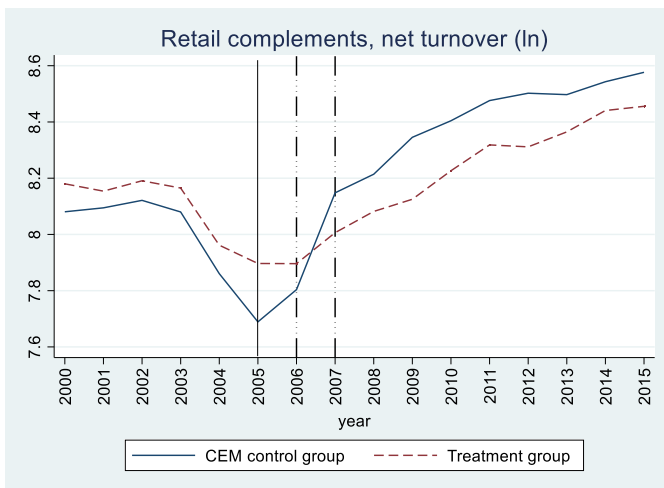


Figure A4a. Complementary goods retailers, net turnover.

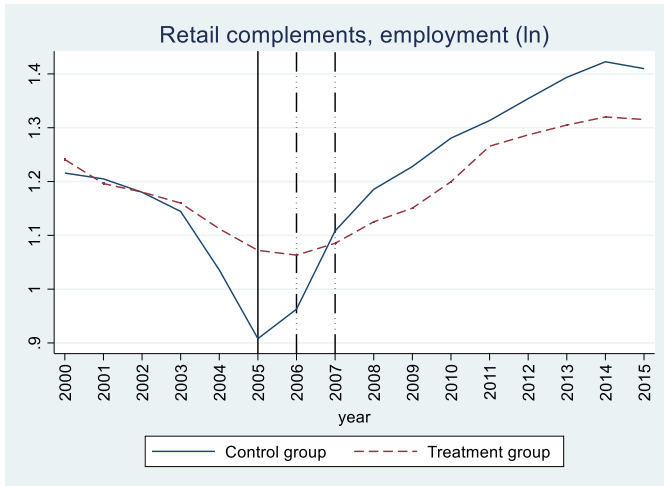


Figure A4b. Complementary goods retailers, employment.



Figure A4c. Substitute goods retailers, net turnover.

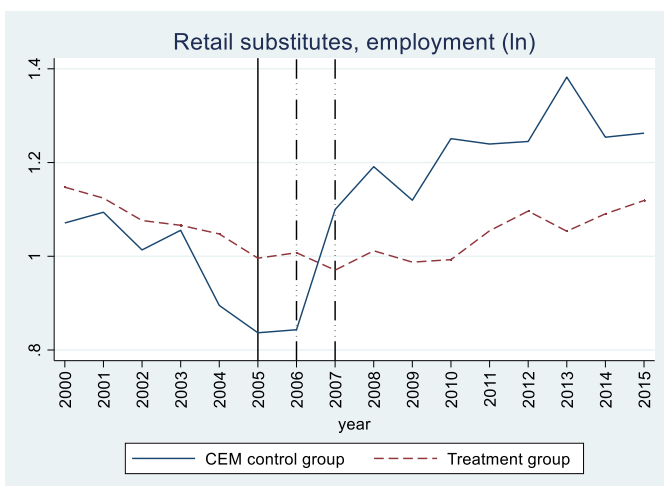


Figure A4d. Substitute goods retailers, employees.

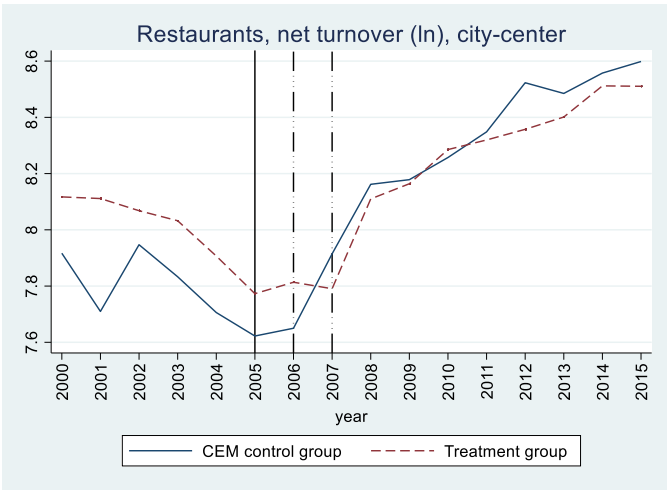


Figure A5a. Restaurants, city center, net turnover.

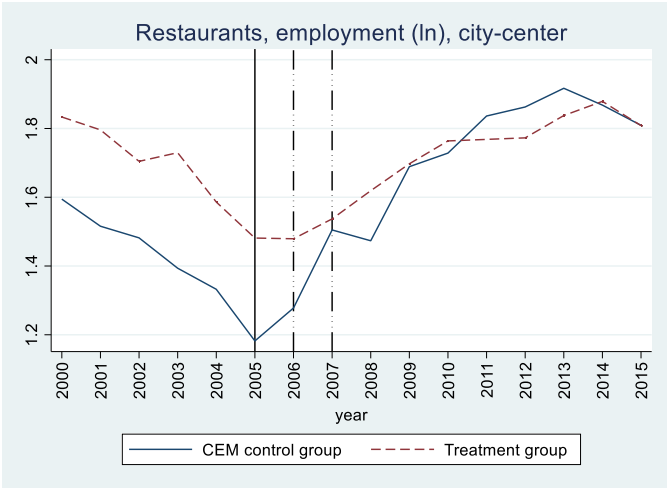


Figure A 5b. Restaurants city center, employment.

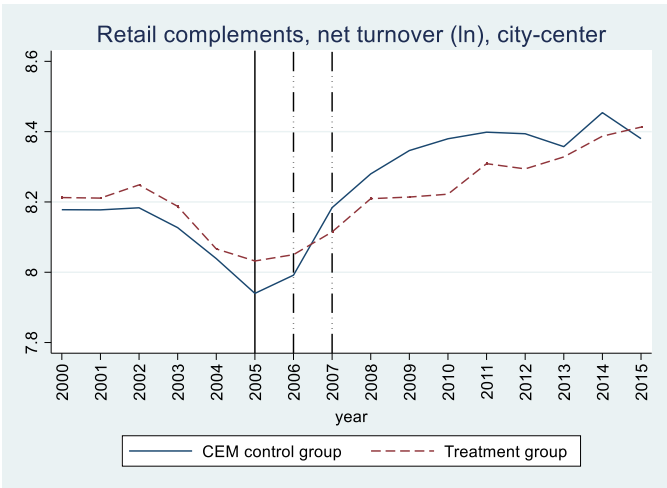


Figure A5c. Complementary goods retailers, city center, net turnover.

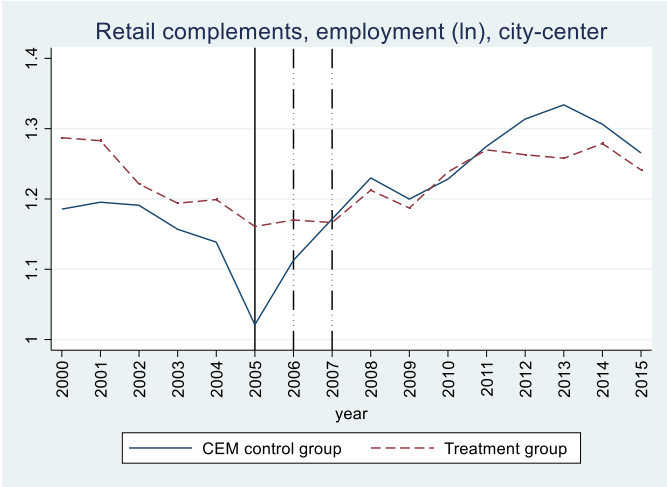


Figure A5d. Complementary goods retailers, city center, employment.

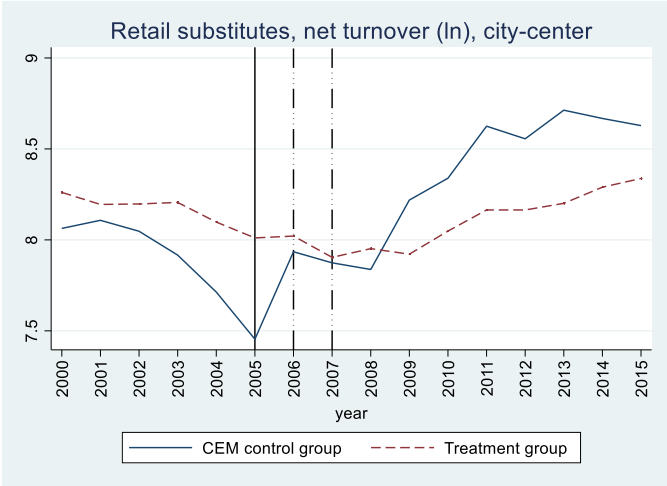


Figure A5e. Substitute goods retailers, city center, net turnover.

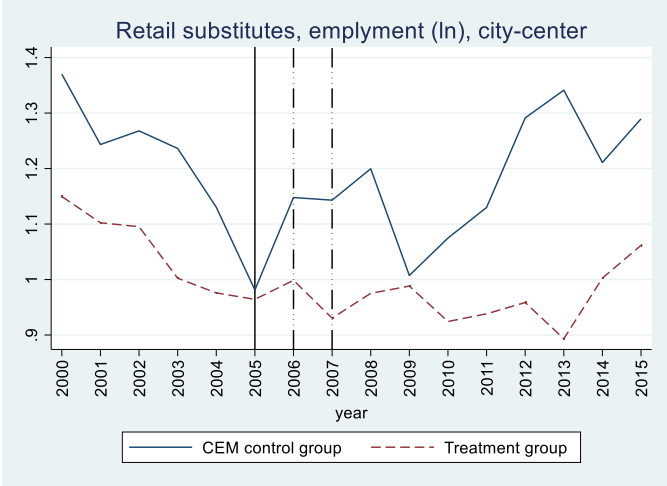


Figure A5f. Substitute goods retailers, city center, employment.

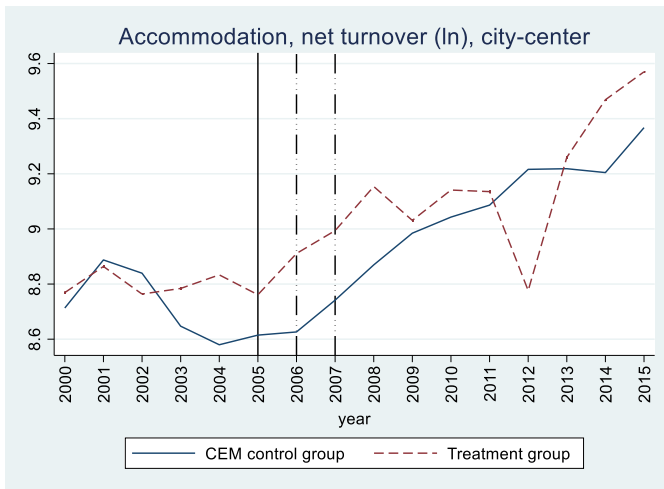


Figure A5g. Accommodation firms, city center, net turnover.

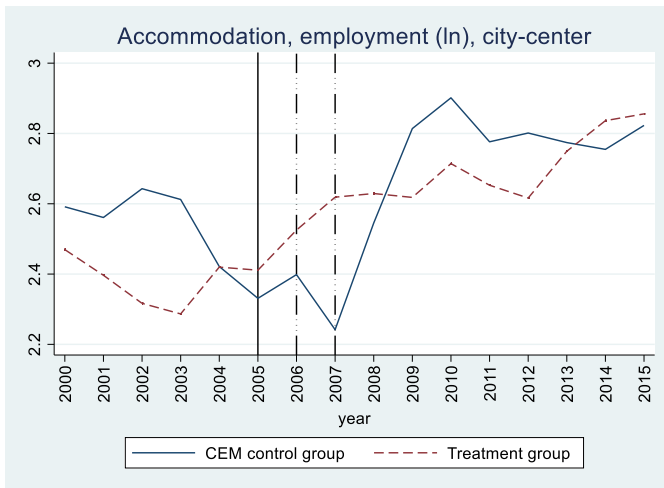


Figure A5h. Accommodation firms, city center, employment.