Article

The Decline of Small Cities: Increased Competition from External Shopping Malls or Long-Term Negative Trends?

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Abstract

We use the entry of 17 external shopping malls in Sweden to investigate how they have affected the performance of incumbent firms located in the city centres of small cities. Estimating a traditional fixed effects regression model while controlling for firm-specific heterogeneity, we find that entry by external shopping malls decreased the labour productivity of incumbent firms in city centres by 5.31%. Revenues decrease by 6.62%, while the reduction in the number of employees (0.45) is small and not significantly different from zero. However, using time-specific fixed effects to control for common time trends in retailing in small cities, we find that the impact on labour productivity, revenues and the number of employees due to the entry of external shopping malls becomes insignificant. Thus, incumbent firms in small cities have a negative development path mainly due to long-term economic trends, possibly because of the combination of urbanization effects and a lack of local investments.

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Introduction

Since World War II, the retail industry has undergone radical changes. One of the most debated developments has been the establishment of large external shopping malls outside traditional downtown markets, a trend that has been linked to simultaneous improvements in the road system and consumers' increased access to and use of cars (Forsberg 1998). Meanwhile, the economy has progressively become experience oriented, with the value of consumption being increasingly related to not only purchased goods but also the full consumer experience (Öner 2014; Pine and Gilmore 1999). One consequence is that consumers are willing to travel farther to shop and stay longer on site. Large shopping malls, often located on the outskirts of cities, have the appropriate combination of goods and services to satisfy these needs and have therefore become more attractive as shopping destinations.

The entry of external shopping malls is often claimed to be one cause for the decline of city centres (Farhangmehr, Marques, and Silva 2001; Monheim 1998; Stone and McConnon 1982). However, the empirical evidence on the effects of external shopping malls on city centres is inconclusive (e.g. Abdelghani 2013; Yalçiner Erkoşkun and Özüduru 2010), and very few studies have investigated how they affect firms located in smaller cities (Heffner and Twardzik 2015). This lack of research is a shortcoming since competition from external shopping malls might act as an incentive for larger cities to redevelop and reinvent their city centres to maintain their attractiveness. Smaller cities, however, have fewer resources, and many of them have experienced negative development during recent decades due to a declining and ageing population. These negative trends occur largely because young people prefer urbanized areas over small cities (Amcoff 2003).

The entry of external shopping malls outside smaller cities implies that incumbent firms in city centres face fiercer competition. It is often argued that external shopping malls are winners due to their wider offering of goods and services and higher productivity levels (Freedman and Kosová 2012). However, the theoretical effects of external shopping malls on incumbent firms in traditional city centres are not exclusively negative. The wider range of a new external shopping mall might attract customers from farther away and result in positive spillover effects for incumbent firms located in city centres (O'Sullivan 2003). The question is whether the positive agglomeration effects can outweigh the combined impact of the negative effects from competition and the long-term negative trends due to the declining populations of smaller cities and their attractiveness.

Studies investigating the impacts of new shopping malls on the performance of incumbent firms in city centres tend to emphasize the negative effects of increasing competition (e.g. Erkip and Özüduru 2015; Guimarães 2014; Stone and McConnon 1982). Although these studies provide important insights into the intricate relationship between external shopping malls and economic growth in traditional city centres, their results are difficult to generalize outside their original contexts because of methodological limitations. Most studies (e.g. Abdelghani 2013; Heffner and Twardzik 2015;

Yalçiner Erkoşkun and Özüduru 2010) are based on case studies that exclusively use interviews and surveys or basic quantitative instruments. In other studies (e.g. Stone and McConnon 1982), survey results are supplemented with regression models at an aggregate level. However, these studies do not allow any spillover effects on incumbent firms to be accurately identified because the data include performance indicators of the new highly productive entrants themselves, leading to an exaggeration of the positive effects (Basker 2007; Rudholm, Li, and Carling 2018). Another limitation is that the majority of these studies are focused on large cities and metropolitan areas, for example, New York and Denver in the US (Lee and McCracken 2012; Pratt and Pratt 1960), Ankara, Turkey (Erkip and Özüduru 2015; Özüduru, Varol, and Yalçiner Erkoşkun 2014) or Brisbane, Australia (Lee and McCracken 2012). Thus, we lack knowledge of the effects of external shopping malls on incumbent firms in smaller cities, even though such firms are potentially more vulnerable to competition from external shopping malls.

We seek to overcome these shortcomings by investigating the effects of external shopping malls on the economic performance of incumbent firms located in the city centres of small cities. To isolate the effects of external shopping malls on the performance of incumbent firms, we consider the entry of external shopping malls as exogenous shocks and apply traditional fixed effect regressions similar to those used in previous studies. We also estimate generalized difference-in-differences regression models to compare the performance of firms entering new areas with their performance before entry and with the performance of firms in small cities without such new external establishments while controlling for both firm-specific and time-specific heterogeneity. We first investigate the effects of external shopping malls on incumbent firms' labour productivity and then decompose this effect into its effects on real revenues and employment.

Estimating a traditional fixed effects regression model while controlling for firm-specific heterogeneity, we find that incumbent firms in city centres experienced a productivity loss of 5.31% when external shopping malls entered the outskirts of the small city. However, many small cities have experienced declining and ageing populations. To account for such negative trends, we also add time-specific fixed effects to the regression specification and estimate what amounts to a generalized difference-in-differences model. We find that all effects of external shopping malls on the performance of incumbent firms in city centres then become insignificant. Thus, our results suggest that incumbent firms in small cities have a negative development path mainly due to long-term economic trends, possibly because of the combination of urbanization effects and a lack of local investments not because external shopping malls have entered areas outside these cities.

In the next section, we discuss the role of firm location in economic geography. In External shopping malls and high street shopping: previous research, we present previous studies about the effects of large investments in external shopping malls on the development of traditional city centre trade. Data and descriptive statistics describes the

data and the empirical method. In Results, we present and discuss the results, while Discussion concludes the study.

Firm Location in Economic Geography

The relationship between two markets is intricate and depends on their threshold and range, the physical distance between them and the available customer base in the region. In line with central place theory (Christaller 1933), the threshold is the minimum population (or income) needed to support the commercialization of a product or service. The range is the maximum distance that consumers are prepared to travel to acquire a good or service.

Assuming a monocentric city, the establishment of an external shopping mall often generates a situation where external and central markets coexist. If the physical distance between the two markets is larger than the sum of their ranges (i.e. their ranges do not geographically overlap), then the likelihood of the two markets having a significant impact on each other is low. However, in the case of small cities, the ranges of the two centres likely overlap, which may generate a competitive situation. External shopping malls are often larger and sell a wider range of high-order goods (i.e. durable goods), thus exhibiting larger ranges than small city centres. Consequently, customers are willing to travel to new external shopping malls from farther away, suggesting that such malls may acquire a share of the customers who typically used to patronize the city centres. This situation can generate increased sales for firms in external shopping malls at the expense of firm sales in traditional city centres.

This kind of market dynamic is more likely to be observed in smaller cities with an often decreasing or stagnating population. While large cities with growing populations may be able to supply the required customer threshold for both new external shopping malls and the old markets located in the city centres, the customer base in smaller cities is often insufficient to support both markets (Freedman and Kosová 2012). Furthermore, strong urbanization trends have made many small cities experience declining or stagnating population trends compared to the trends of their larger counterparts (Statistics Sweden [SCB] 2020).

In Sweden, cities with less than 10,000 inhabitants increased their population by an average of 0.34% yearly between 2000 and 2017, while the population in cities with 10,000-25,000 inhabitants increased yearly by an average of 0.47%, and the population in cities larger than 25,000 inhabitants increased by an average of 1.22%. The population of the three main metropolitan areas, that is, Stockholm, Gothenburg and Malmö, increased by an average of 1.53% during the same time period.[1] If the customer base in a region is small, the most attractive retail cluster with a competitive advantage over neighbouring shopping malls will 'win' the customers. Thus, in small monocentric cities, the establishment of an external shopping mall may claim much of the city centre's old customer base and may thus increase the likelihood that city centres in small cities experience a decrease in demand following the entry of external shopping malls.

With the problem generated by a low customer base, the response of city centres to increased competition depends on their capacity to win back some of their old customers and attract new customers and thus increase their economic performance, that is, increase output (i.e. revenue) for the same (or lower) input (i.e. employment). Doing so requires some amount of innovation (Porter 1990), as firms in city centres are compelled, for example, to differentiate their products from those of their external competitors to limit competition and ensure resilience (Picone, Ridley, and Zandbergen 2008). However, incumbents that do not react appropriately may experience a decrease in revenue when an external mall enters and may likely be eventually displaced from the market.[2]

However, the possible effects of investments in external shopping malls on local incumbents are not exclusively negative. The wider range of a new external shopping mall is likely to attract an increased customer base that to some extent may spill over to the other firms in the region, including city centre incumbents. These potential positive effects generated by the proximity of the two markets are known as agglomeration externalities. The functional mechanism of agglomeration externalities is based on economies of scale that occur when the sales of one firm increase or when production costs decrease because of firm co-location (O'Sullivan 2003). Agglomeration externalities can occur in the form of both demand and supply spillovers.

Demand spillovers are specific to consumer-oriented industries such as retail, the hotel and restaurant industry and commercial services, and such spillovers occur when the sales of one firm are affected by its location relative to other firms in the area. Firm co-location may minimize consumer search costs and maximize consumer utility (Brown 1989; Van Handel 1970; Wolinsky 1983), contributing to the attractiveness of the region and generating a customer flow between the new external shopping mall and the traditional central market. As explained by Marshall's (1890) theory of agglomeration economies, the co-location of firms also generates supply spillovers in the form of decreased input costs, a local skilled labour pool that facilitates a more efficient labour matching process and increased knowledge spillovers in the region (McCann 2001; O'Sullivan 2003).

External Shopping Malls and High Street Shopping: Previous Research

How are incumbent firms in the city centres of small cities impacted by the entry of external shopping malls? Do negative competition forces or positive agglomeration spillovers dominate when external shopping malls enter the outskirts of small cities? A review of previous studies in the field shows that the answer is not straightforward.

The establishment of an external shopping area often includes entry by at least one large anchor store, and several studies have attempted to investigate how these big-box stores affect the markets they enter. Such large retailers are likely to display high levels of labour productivity (Foster, Haltiwanger, and Krizan 2006). According to Basker (2007), Walmart's real value added per worker was 40% higher than that of other

general merchandise retailers, and its productivity increased by 55% over the 1982–2002 period. Entry by these retail giants in local markets is thus likely to displace less productive local retailers. Jia (2008) reported that entry by Walmart caused 50–70% of the net exits of small discount retailers in the US market and that the exiting establishments were 25% less productive than the surviving incumbents.

This negative effect on labour productivity seems to be due to competition forces that induce a decrease in sales for incumbent firms. Singh, Hansen and Blattberg (2006) indicated that incumbent supermarkets lost 17% of sales volume due to customer migration to new Walmart stores. This result was later supported by Ailawadi et al. (2010), who also found that competition effects prevailed over any agglomeration effects. Furthermore, both Ellickson and Grieco (2013) and Arcidiacono et al. (2020) observed that these competitive effects generated by the establishment of new Walmart stores decayed with distance from the entry location.

In certain contexts, however, the decrease in sales seems to be followed by quick adjustments in employment. For example, Haltiwanger, Jarmin and Krizan (2010) identified negative effects of a big-box store on employment at single unit and smaller chain stores located in the immediate area as the large entrant. However, employment levels do not always follow revenue changes. Jones and Doucet (2000) found increasing proportions of retail employment within 2 km of a new big-box store, and Daunfeldt et al. (2019) found that incumbents located near IKEA stores experienced increasing revenue levels due to positive spillover effects, while the effects on employment were negligible.

Nevertheless, it is difficult to generalize these results to our setting because they focus on the entry of a large big-box entrant (often Walmart) in a shopping area, whereas our study focuses on the effects of the establishment of a whole external shopping mall. External shopping malls in small cities in Sweden also tend to differ from those in larger cities because they seldom include one dominant store, such as IKEA. Instead, they often include a number of medium-sized establishments.

Early studies that focused on the impact of external shopping malls on incumbent retailers emphasized the negative competition effect (see Table 1). For example, Pratt and Pratt (1960) used interviews to identify changes in customer behaviour generated by the establishment of suburban shopping malls, observing a shift in the demand of suburban consumers from the central city to these new suburban shopping malls. They identified not only a net decrease of 54% in the number of customers of incumbents located in the central city (New York) but also a 22% decrease in the number of customers of incumbent stores located in suburban city centres.

Stone and McConnon (1982) summarized the survey results and outcomes of county-level econometric studies and concluded that one-fourth to one-third of the merchants located in entry areas perceived new shopping malls as having a negative impact on their businesses. More recent studies have also emphasized competition over agglomeration effects.[3] Howard and Davies (1993) used surveys complemented by pedestrian counts, vacancy statistics and changes in land use patterns to assess the 'health' of traditional shopping streets. The surveyed shop owners acknowledged decreases in both sales and

Table 1. Previous Studies on the Impact of External Shopping Malls on City Centres.

Study	Level of analysis	Treatment	Dependent variable	Period	Method	Summary of the main results relevant to our study
Pratt and Pratt (1960)	City (New York area, the United States)	Shopping mall	Number of customers	1957 and 1958	Interviews (customers)	There are decreases of 54% and 22% in the number of customers in the central city and in suburban city centres, respectively
Stone and McConnon (1982)	County (Iowa, the United States)	Shopping mall	Store owner perception of own performance percentage surplus/ leakage of sales total county sales	1976–1981	Survey (retailers) descriptive analysis aggregate quantitative analysis (trends not accounted for)	New shopping malls negatively affect incumbent retailers. Complementary retailers may experience positive effects, while concurrent retailers may experience negative effects. New malls increase the sales index in entry counties at the expense of adjacent counties
Howard and Davies (1993)	City centre (Tyneside region, the United Kingdom)	Shopping mall	Sales pedestrian activity employment land use changes vacancy	1986–1991	Survey (retailers and customers)	An average of 50% of the retailers perceives a decrease in sales following shopping mall entry. Pedestrian activity decreases in the city centre. The employment of incumbent firms in the city centre decreases. The vacancy rate in the city centre increases
Yalçiner Erkoşkun and Özüduru (2010)	Main street	Shopping mall	Retail structure	2000, 2008 and 2009	Case study/ descriptive	The number of shops on the main street increases. Even with the proliferation of global and national chains, local brands are still dominant on the main street. The retail structure has changed towards a dominance of the restaurant industry

(continued)

Table 1. (continued)

Study	Level of analysis	Treatment	Dependent variable	Period	Method	Summary of the main results relevant to our study
Lee and McCracken (2012)	City (Denver, the United States and Brisbane, Australia)	Shopping mall	Retail structure	2010	Descriptive analysis, correlation analysis	Retail abandonment has been observed in Denver following the process of suburbanization of both housing and retail. Brisbane, on the other hand, has been able to preserve the central business district as its major retail area in the city. This is mainly due to differences in public policy and ownership patterns in the two cities
Abdelghani (2013)	City centre (Muscat region, Oman)	Shopping mall	Retail structure	2009–2010	Survey (customers) interviews (customers)	Shopping malls have a negative impact on traditional markets in certain retail subsectors, such as clothing and cosmetics. However, the traditional market is maintaining its attractiveness in regard to local and traditional goods (clothing and food) and as a social meeting place
Özüduru, Varol, Yalçiner and Erkoşkun (2014)	City centre shopping street (Ankara, Turkey)	Shopping mall	Consumer profiles Consumer preferences Consumer spatial behaviours	2010	Survey (customers)	Shopping malls are preferred by older, better educated, car-owning households with children living in suburban areas. Shopping streets are preferred by the younger population – singles without children and students. Shopping malls are preferred for shopping, strolling, eating and drinking. Shopping streets are preferred in particular for socializing, entertainment and strolling. Shopping malls are patronized by customers from the whole city. Shopping streets are preferred by customers from the surrounding neighbourhoods

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Table 1. (continued)

Study	Level of analysis	Treatment	Dependent variable	Period	Method	Summary of the main results relevant to our study
Erkip and Özüdüru (2015)	Firm (Ankara, Turkey)	Shopping mall	Store owner perception of own performance land use changes	2011 and 2013	Survey (retailers)	Shopping street retailers complain about shopping mall competition. However, land use analysis indicates that firms in city centres are resilient. This is due to, on the one hand, firms developing resilience strategies and a complementary offer and, on the other hand, increased population and income levels in the region
Guimarães (2014)	City (Braga, Portugal)	Shopping malls	Shopping behaviour	2009	Survey (consumers)	A total of 46% of residents admitted to a possible transfer of shopping to external shopping malls. This is expected to lead to not only a decrease in the vitality and viability of city centres but also reactive measures in city centres
Heffner and Twardzik (2015)	Municipality (Silesia region, Poland)	Shopping malls	Retail structure	2013	Interviews (municipal authorities)	There is a generalized perception that the entry of shopping malls leads to an outflow of customers from smaller shops to external shopping malls. However, an expansion of small supermarkets is observed in small non-rural municipalities. A decline in door-to-door trading, street trading and traditional shops (e.g. blacksmith shops) is also noted. However, the retail structure has not changed considerably in rural municipalities, where small shops continue to dominate

(continued)

Table 1. (continued)

Study	Level of analysis	Treatment	Dependent variable	Period	Method	Summary of the main results relevant to our study
Daunfeldt et al. (2019)	Firm (Sweden)	IKEA retail areas	Firm revenue firm employment	2000–2010	Difference-in-differences (trends accounted for)	Revenues for incumbent retailers located 1 km from a new IKEA retail area experienced a 7% increase due to positive spillovers. The effect was insignificant for firms located less than 1 km from a new IKEA retail area or in city centres. The positive effects dominate the negative effects of competition only for firms selling complements to IKEA, while substitute firms located 2-5 km from the new retail area experience revenue loss due to entry by IKEA. The effects on employment are statistically insignificant

employment following the entry of external shopping malls. Other authors noted that many of these stores exited the market because they were unable to compete with the new malls (Farhangmehr, Marques, and Silva 2001; Monheim 1998).

Several previous studies argue that small- and medium-sized cities are more prone than larger cities to negative impacts due to new out-of-centre facilities (Bromley and Thomas 1995; Thomas and Bromley 1995; Whysall 1995). Furthermore, Thomas and Bromley (2003) indicate that negative effects are larger, in absolute terms, in smaller towns (with 6,000–10,000 residents) than in medium-sized towns (15,000–50,000 residents). Small cities whose retail vitality is based on a smaller number of retailers (Robertson 1999) are thus more sensitive to the change in the geographical distribution of retail space, which is increasingly located in peripheral areas following the establishment of new shopping malls (Kickert and vom Hofe 2018). In a small city, a new commercial development often leads to a zero-sum game: the pool of existing customers switching focus towards the new development, while city centres decline to 'residual' neighborhood status (Balsas 2014; Bromley and Thomas 1995; Delage et al. 2020; Thomas and Bromley 1995).

Although these studies provide important insights into the relationship between external shopping malls and economic outcomes in traditional city centres, their results are difficult to generalize outside their original contexts because of several methodological limitations. First, several studies are based on case studies that use exclusively qualitative research methods or descriptive statistics (e.g. Yalçiner Erkoşkun and Özüduru 2010) and basic quantitative instruments. For example, Abdelghani's (2013) study is solely based on surveys and interviews with shop owners. Stone and McConnon (1982) used surveys and supplemented them with regression models at an aggregate level. However, the use of aggregate data does not allow any spillover effects on incumbent firms to be accurately identified because the data include the performance indicators of the new entrants themselves. These new shopping malls often exhibit high sales levels and are highly productive, and averaging over all firms, that is, both new and incumbents, most likely leads to an exaggeration of the positive effects for incumbent retailers (Basker 2007; Rudholm, Li, and Carling 2018).

Another limitation originates in the geographical restrictions applied in these studies. Several of them are focused on large cities and metropolitan areas, for example, New York and Denver in the United States, Ankara, Turkey or Brisbane, Australia. The viability of these city centres is sustained by large populations and high income levels. Smaller cities, however, are more likely to be vulnerable to investments in external shopping malls. Nonetheless, the effects of shopping malls on incumbent firms in small cities have received scarce attention in the literature. Heffner and Twardzik (2015) attempted to discuss the impacts of shopping malls in smaller towns and rural areas, but their study was exclusively based on interviews with local authorities. The answers they collected indicated a generalized perception that the entry of shopping malls leads to an outflow of customers from smaller shops and a decline in door-to-door trading, street trading and traditional retail shops. They also observed that while the retail structure has not changed considerably in rural municipalities,

where small shops dominate, small but non-rural municipalities have experienced an expansion of small supermarkets.

Additionally, previous studies often do not control for essential factors, such as trends in the output variable (e.g. Stone and McConnon 1982), when investigating the effect of large retail establishments on the performance of incumbent firms. Rodrígues-Pose (2018) argued that for a long time, smaller places and rural areas have been regarded as 'places that do not matter', characterized by economic decline and a lack of opportunities and, consequently, investments. Wrigley and Lambiri (2014) also argue that the cities most affected by retail decline are cities facing fragile economic contexts, due to, for example, jobs and residents also moving out of the city centre. Not accounting for such trends means that a negative effect on incumbent retailers due to long-term socio-economic or demographic trends in entry cities might be mistakenly identified as an effect of new external shopping malls. When investigating spillover effects in smaller cities, trends are important to consider because wages have persistently lagged in these cities compared with their larger urban counterparts (Henderson, Shalizi and Venables 2001; Rice, Venables and Pattachini 2006) due to the gap in productivity between urban and rural areas that is inherently linked to firm productivity (Saito and Gopinath 2009).

Among previous studies that accounted for negative time trends, Artz and Stone (2012) identified a negative impact of Walmart supercentres that is limited to larger competitive supermarkets, concluding that these Walmart giants do not hurt locally owned subsidiary business establishments. This result is also confirmed by Hicks, Keil and Spector (2012). In addition, investigating the effects of IKEA shopping malls, Daunfeldt et al. (2019) found no statistically significant effect on the performance of incumbent retailers located in city centres. Arcidiacono et al. (2020) also corrected for trends in their models, finding negative effects on incumbent firms' revenues that quickly decline with distance from new Walmart stores (from 12% at 1.6 km (1 mile) to 5% at 4.8-8 km (3-5 miles)) and become insignificant for distances greater than 8 km (5 miles). Ellickson and Grieco (2013) reported similar results with respect to the effects of entry by Walmart on employment. These studies provide examples of robust statistical analysis, but only one of them, Daunfeldt et al. (2019), investigates the effects of external shopping malls on the performance of city centre firms, and none explicitly focuses on the impact on the performance of firms located in small cities.

However, not all small cities are declining and plagued by disinvestment. Based on a study of more than 1000 small and medium-sized British cities, Wrigley et al. (2009) emphasize the role of complementarity for meeting competition from new external centres. They find that shops as bakeries, drug stores and healthy food stores, complementary to the new retail developments, do not seem to experience any negative effects. For the small city of Haparanda, Sweden, Han et al. (2018) report that entry by IKEA had a positive impact on incumbent retailers selling complements to the products marketed in the new IKEA shopping area. Delage et al. (2020) study small- and medium-sized towns in France over a period of 40 years and find that some of them resist decline as well. City size but also the internal and external employment rates are among the variables contributing to this outcome. Cities with upward-trending

developments are found to have high internal employment rates (i.e. high rates of city residents who work locally) and low external employment rate (i.e. low rates of outsiders who work within the city borders), as well as anchor stores in their city centres. Increased demand for retail within the city may also be maintained by improving the mix of uses in these central districts (Popp 2014) – through, for example, changes in the physical structure of the city so that the mix of uses (e.g. residential, commercial and office space) is improved; however, this is a process that requires a long-time vision and plan of action.

Several studies document large investments in the city centres in the form of, for example, new shopping malls (Crosby et al. 2005; Thomas and Bromley 2002, 2003). The results of these investments are however debatable; while some local positive effects are recorded, it seems that the new shopping malls are more prone to becoming markets in themselves, making that the distance decay of any positive spillover effects is very abrupt and that competition effects take quickly over. As the authors argue, it is however difficult to isolate the exact magnitude of the effects of the new developments due to the methodological limitations of these studies (Crosby et al. 2005).

To summarize, the results of previous studies are far from conclusive, and there is a lack of studies that use estimation techniques to account for time-specific heterogeneity. There is also a dearth of studies investigating the effects of external shopping malls on incumbent firms in small cities. We overcome these shortcomings by using the entry of external shopping malls in small cities as a natural experiment and by applying regression techniques in a difference-in-differences setting to investigate how the entry of external shopping malls affects the performance of incumbent firms located in city centres. To investigate whether long-term economic trends in these small cities can potentially confound the estimation of the effects of external shopping mall entry on incumbent city centre firms, we present and discuss the results of a model both with and without controls for time trends.

Data and Descriptive Statistics

The City Centre

In line with the morphological classification of cities described in the European Union's European Spatial Planning Observation Network (ESPON) programme, we define cities with a population of 5,000–25,000 inhabitants and a population density of more than 300 inhabitants per square kilometer as small cities (ESPON 2014).[4] We then define the geographical scope of these city centres based on a combination of population density and firm density, taking into account geospatial barriers. The limits of the city centre are established based on 250 m × 250 m geographical quadrants defined by Statistics Sweden. A quadrant is part of the city centre if its density corresponds to minimum levels in terms of both population and the number of firm establishments. The minimum levels vary with the size of the total city population and are, on average, equal to 219 residents and 13 firms per geographical quadrant.[5]

The requirements for meeting the minimum levels for both population density and store density mean that areas with sole functions, such as residential neighbourhoods or external shopping malls, cannot be defined as city centres. Furthermore, no cities with fewer than 10,000 inhabitants fulfil the simultaneous minimum requirements for population and firm density, and these cities are consequently excluded from our analysis. Of the 76 cities with more than 10,000 inhabitants that are defined as small, eight cities do not have a city centre according to the definition above. This leaves us with a sample of 68 small cities, of which 17 experienced the entry of a new external shopping mall during our period of analysis (2000–2016).[6]

External Retail

Following the definition used by the Nordic Council of Shopping Centres (NCSC 2017), we classify shopping malls into the following nine categories based on their gross leasing area (GLA), number of tenants and location: city malls, neighbourhood centres, community centres, outlet centres, theme centres, regional malls, retail parks, regional retail parks and super-regional malls. The external shopping malls located in the small cities included in our study fall into four of these categories, that is, city malls, neighbourhood centres, community centres and retail parks. City malls are located in city centres, and neighbourhood and community centres are small and located in predominantly residential neighbourhoods. We therefore focus our study on the 17 retail parks that were established during the 2000–2016 period.[7] The smallest retail area in our sample has a GLA of 7,600 sqm (approximately 82,000 sq ft), while the largest has a GLA of 40,475 sqm (approximately 436,000 sq ft), with the average being 20,674 sqm (approximately 222,500 sq ft); see Table 2.

An example of the typical location of these external shopping malls in relation to the city centres in these small cities is illustrated in Figure 1.

Descriptive Statistics for the Outcome Variables

All limited liability firms in Sweden are required by law to submit their annual reports to the Swedish Patent and Registration Office (PRV). We use a dataset from Bisnode, a consulting company that compiles this information from PRV. All data in the annual reports are included, such as revenues, the number of employees, location and the industry classification.[8] Our main dataset covers 2,506 firms active for at least one year during the 2000–2016 period in the city centres of the 68 small cities included in our study, yielding an unbalanced panel of 20,221 firm-year observations.

We seek to investigate how the entry of external shopping malls in these small cities affects the performance of firms located in city centres. Following Özçelik (2020), we measure firm performance by labour productivity and decompose this measure into real revenues and the number of employees. Descriptive statistics for the first and last years of the analysis are presented in Table 3 for incumbent firms located in city centres. We discount firm revenues by the Swedish consumer price index and adjust the number of

Table 2. External Shopping Malls that Opened Between 2000 and 2016 in Small Cities with 10,000–25,000 Inhabitants in Sweden.

City	Shopping mall	Entry year	GLA 2016 (sqm)
Sandviken	Mosaiken Handelsområde	2002	14,800
Norrtälje	Knutby Torg	2005	38,050
Stenungsund	Strandplan	2005	23,000
Katrineholm	Lövåsens Handelsområde	2006	36,875
Strängnäs	Solberga Köpcenter	2007	21,200
Mora	Noret Köpcentrum	2007	40,475
Visby	Handelsplats Stenhuggaren	2008	18,950
Falköping	Ålleberg Center	2008	19,350
Staffanstorp	Rondellen, Staffanstorp	2008	15,000
Ludvika	Lyviksberget	2008	22,400
Ljungby	Ljungbyporten	2009	12,350
Gällivare	Malmhedens Handelsområde	2011	20,100
Gislaved	Smålandia Köpcentrum	2011	7,600
Lidköping	Änghagens Handelsplats	2012	18,000
Västervik	Ljunghedens Handelsområde	2012	21,550
Härnösand	Handelsområde Ankaret	2012	15,975
Vetlanda	Nydala Handelsområde	2014	9,500

employees by adding one because the only 'employed' person is often the owner and many firms thus record zero employees.

The data show that labour productivity decreased somewhat during the study period regardless of whether or not the city had an external shopping mall. However, Table 4 shows that the decrease in productivity is more pronounced in small cities with external shopping malls (7.53%) than in small cities without external shopping malls (3.55%). Decomposing labour productivity into real revenues and employment, we observe that the average revenue of firms in city centres remains relatively constant, while the number of employees increases. The data indicate a change of only 0.26% in the average real revenue of firms between 2000 and 2016 and a considerably larger change in employment, 7.32%. In city centres without external shopping malls, both revenues and the number of employees increase, but the increase in real revenue (7.96%) is superseded by the increase in employment (11.69%). However, the revenues of firms in the city centres of small cities with external shopping malls decrease by 12.11%, while the employment numbers indicate no change (−0.20%).

The question is how many of these changes are due to the entry of the new external shopping areas. These comparisons of how the outcome variables have changed from 2000 to 2016 provide interesting information, but they cannot isolate the entry effect from the possible effects of other events or from the effects of local, regional and national economic trends. In the next section, we attempt to isolate the entry effects of
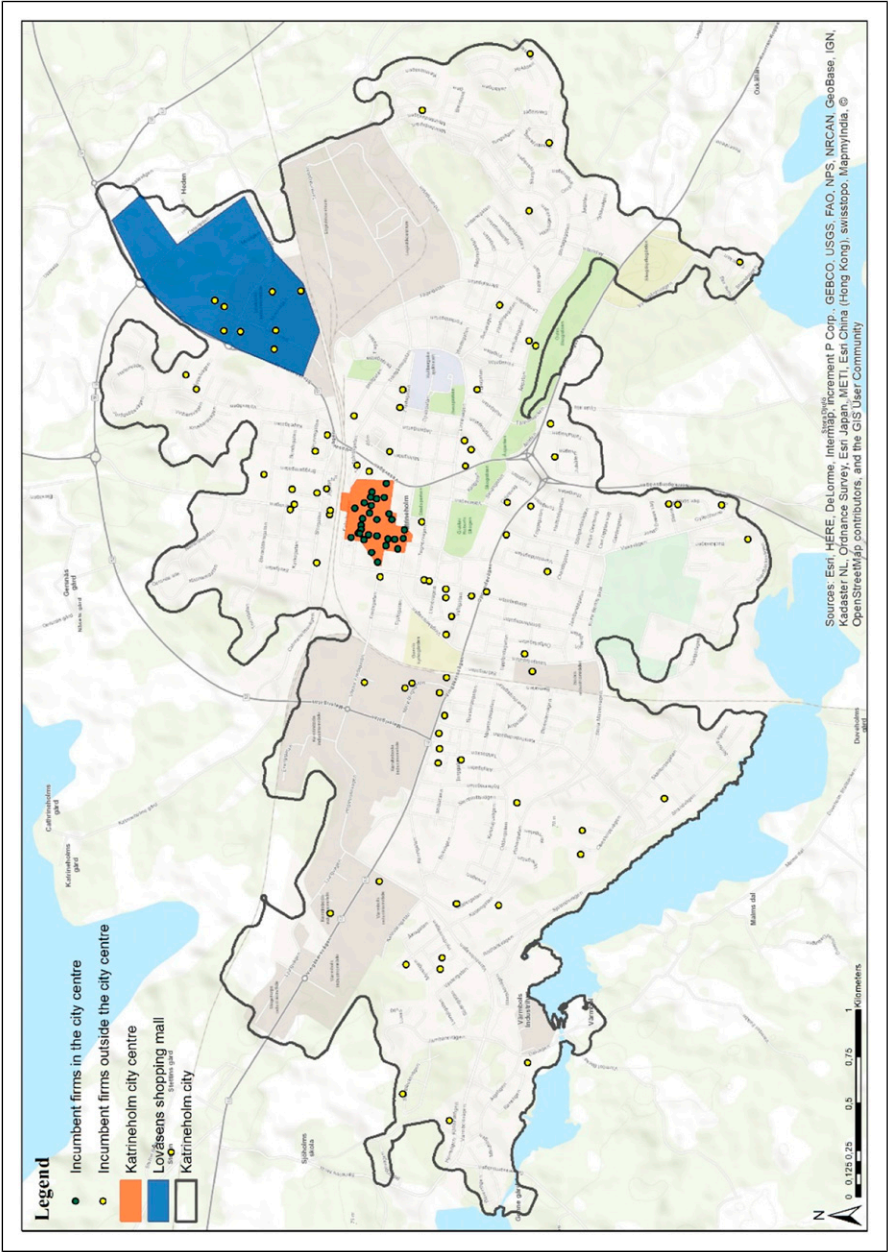
Figure 1. City of Katrineholm with its city centre and Lövåsens retail park.

Table 3. Descriptive Statistics for the Variables in Our Study (for City Centre Incumbents), 2000 and 2016.

Variable	2000			2016		
	Mean	SD	N^{a}	Mean	SD	N^{a}
labour productivity (1,000 SEK)	1015.6	783.1	1,080	965.5	997.6	1,235
real revenue (1,000 SEK)	5548.4	9733.8	1,091	5562.6	11,019.2	1,276
employment (number of employees)	4.78	4.27	1,080	5.13	4.50	1,235

[a]The number of observations (N) differs slightly when computing statistics for labour productivity and for employment, on the one hand, and for real revenue, on the other hand, because some firms reported revenues but did not report the number of employees.

Table 4. Percentage Change in Average Labour Productivity, Real Revenues and Employment for City Centre Incumbents, 2000–2016.

City centre	Labour productivity			Real revenue			Employment		
	2000	2016	% change	2000	2016	% change	2000	2016	% change
All	1015.7	965.50	−4.94	5548.4	5562.6	0.26	4.78	5.13	7.32
with external shopping malls	1058.7	979.00	−7.53	5968.3	5245.5	−12.11	5.09	5.08	−0.20
without external shopping malls	992.91	957.63	−3.55	5324.9	5748.8	7.96	4.62	5.16	11.69

external shopping malls from these other factors by means of a difference-in-differences regression model.

Model Identification

We use entry by new external shopping malls as a natural experiment to investigate how such entry affects incumbent firms located in the city centres of small cities. The main identification problem is that firms located in city centres cannot be observed in the counterfactual state when no large external shopping centre enters the market. In addition, as noted by Greenstone, Hornbeck, and Moretti (2010), firms tend to choose locations that maximize their profits, implying that the entry cities differ from randomly selected cities. If we want to measure how new external shopping malls affect incumbent firms in the inner cities, we need to identify a set of control cities that are as identical as possible to the entry cities.

In line with Hotelling (1929) spatial differentiation theory, the size and offer of a retail site determine its market area and, therefore, the number of consumers who are willing to travel to the site for shopping, which is key to reaching a profitable sales

level (e.g. Brown 1989; Ghosh and McLafferty 1987; González-Benito and González-Benito 2005; Lee and Kim 2018). Therefore, retail sites of different sizes (and, thus, offers) may substantially differ from each other and from random cities in Sweden. By restricting our sample to small cities with 10,000–25,000 inhabitants, where the potential customer base is limited, we inherently focus on a group of cities with similar purchasing power. More than 70% of these cities show negative or low positive population growth trends, and they are also geographically similar, with monocentric urban structures focused around a small traditional core; therefore, cities without external shopping centres in this small-city group are considered appropriate as controls for our treatment group of small cities with external shopping centres.[9]

We have access to firm level data from 17 cities where entry took place at different points in time during a 17-year period from 2000 to 2016. In addition, we have access to a group consisting of 51 cities with similar pre-entry characteristics regarding size, geography, etc. as the entry cities that we follow over the same time period as the entry cities, but which did not experience entry. As such, we can use both spatial and temporal variation in the data to estimate the impact of the establishment of external shopping malls on incumbent firm outcomes. Since external shopping mall entry happens at different points in time in different cities it is likely that the estimated effect is due to entry and not some confounding factor. The alternative is that there is some non-shopping mall entry related event that happen simultaneously with shopping mall entry in some or all of the entry cities, and that is of such magnitude that it affected the incumbent firms to a similar extent as the external shopping mall entry. We are not aware of any such events, and since the entry cities are small Swedish cites, we find it unlikely that there are such events that we have not heard of.

To determine the effect of new external shopping malls on the performance of city centre firms, we consider the general setup illustrated in equation (1) as our point of departure

$$\ln Y_{it} = \beta_0 + \beta_{TR} \times TR_{it} + u_{it} \tag{1}$$

where Y_{it} is labour productivity, measured as real revenues per employee and evaluated annually at the firm level for all firms in the city centres. The treatment variable, TR_{it}, is equal to one after the entry year for firms located in cities that have experienced the entry of external shopping malls in the study period and zero before the entry year for firms in cities with external shopping malls and for firms in cities that have not experienced the entry of an external shopping mall during the study period.

The model specification above allows us to compare firms in the treatment group (i.e. firms located in small cities with the entry of external shopping malls) to firms in the control group (i.e. cities with external shopping malls, before entry and cities without the entry of external shopping malls). The hypothesis to be tested is whether the development of labour productivity significantly differs between the two groups of

firms (treated and control), which would be indicated by a statistically significant β_{TR} coefficient. However, the identification of the β_{TR} coefficient may be confounded by a potential correlation between the treatment variable (TR_{it}) and the error term (u_{it}), for example, due to omitted variables.

To address this issue, we follow Arcidiacono et al. (2020) and include firm-specific fixed effects to account for time-invariant heterogeneity at the firm level. Such heterogeneity includes, but is not limited to, type of business, location, opening hours, managerial skill, etc., if constant during the period under study. By including the fixed effect on the firm rather than the city level, the model captures all firm level time-invariant heterogeneity that could, if correlated to the entry of external shopping malls, bias our results. Having a firm-specific fixed effect makes having a city level fixed effect redundant as long as firms do not move between entry- and control group locations, which is the case in our study. If firms do not change group, the firm level fixed effects fully account for the average labour productivity (real revenues and number of employees) of a firm belonging to the treatment or control group. In addition, including fixed effects on both firm and city level creates a multicollinearity problem in the regression, and the city indicator will be dropped due to perfect collinearity because there is no store that changes group.[10]

However, even after the inclusion of firm-specific fixed effects, remaining heterogeneity related to time-varying trends or chocks common to small cities may further impair the correct identification of the β_{TR} coefficient. A time-specific fixed effect captures all time-variant heterogeneity in labour productivity (real revenues, number of employees) among the different years under study. As such, it accounts for trends in economic development in the small cities included in our study, but also for potential chocks to small city economies that occur one or more years in our data. If we do not account for such time trends or other time related events, we might confound the effects of long-lasting trends in small cities with the entry effects of external shopping malls. Consequently, for the correct identification of the β_{TR} coefficient, we need to specify u_{it} as a function of firm fixed effects, γ_i, time-specific fixed effects, ϑ_t, and a residual error term, $\varepsilon_{it} \sim iidN(0,\sigma_{\varepsilon}^2)$

$$u_{it} = \gamma_i + \vartheta_t + \varepsilon_{it} \qquad (2)$$

Consequently, our most general model can be written as a generalized difference-in-differences specification

$$\ln Y_{it} = \beta_0 + \beta_{TR} \times TR_{it} + \gamma_i + \vartheta_t + \varepsilon_{it} \qquad (3)$$

Thus, our identifying assumption is that the timing and location of new external shopping malls are uncorrelated with ε_{it}, conditional on firm- and time-specific fixed effects. Finally, note that the log transformation of the outcome variable ($\ln Y_{it}$) has the benefit of making the parameter estimate related to the effect of entry on incumbent store labour productivity be interpretable in percentage terms after using the formula $100 \times [\exp(\beta_{TR}) - 1]$ (Wooldridge 2010).

Results

Effects of External Retail on City Centre Incumbents

We start by estimating a model with firm-specific fixed effects (Model 1) and then add time-specific fixed effects (Model 2), as suggested in previous research (e.g. Artz and Stone 2012; Drewianka and Johnson 2006; Newmark, Zhang, and Cicarella 2008). Model 2 is our most general model and controls not only for firm level time-invariant heterogeneity among the firms in the treatment and control groups but also for common trends in labour productivity for the firms located in the city centres of small cities.

The estimated average effects of external shopping malls on the labour productivity of incumbent firms located in small city centres are presented in Table 5. The results from Model 1 indicate a negative and statistically significant effect of external shopping malls in small cities on the labour productivity of firms in city centres when ignoring the possibility of long-term trends affecting the results. Based on the results, labour productivity declines by an average of 5.31% for firms located in city centres when external shopping malls enter these small cities. Revenues decrease by 6.62%, while the reduction in the number of employees (0.45%) is small and not significantly different from zero.

However, the firm-specific fixed effect regression (Model 1) does not account for any time-specific heterogeneity. Therefore, it is possible that the negative effects on firms in city centres could be due to negative economic trends in small cities rather than an impact of the entry of external shopping malls. To account for this possibility, we incorporate time-specific fixed effects in our model, creating a generalized difference-in-differences model (Model 2 in Table 5). The results now show that the effects of the entry of new external shopping malls on the performance of firms located in the city

Table 5. Effects of External Shopping Malls on the Productivity of City Centre Firms.

	Model 1[a]	Model 2[a]
	Coefficient (p-value)	Coefficient (p-value)
Labour productivity	−0.055*** (0.005)	0.000 (0.996)
Effect	*−5.31%****	*0.01%*
Real revenues	−0.068** (0.013)	0.000 (0.997)
Effect	*−6.62%***	*−0.01%*
Employment	−0.005 (0.754)	0.004 (0.811)
Effect	*−0.45%*	*0.37%*
AIC (labour productivity)	11,192	11,083
R-squared (labour productivity)	0.0001	0.0028

***significant at the 0.01 level; ** significant at the 0.05 level; * significant at the 0.1 level.
[a]The number of observations is lower for the model with employment and productivity as the dependent variables (19,953) than for the model with real revenues as the dependent variable (20,221) because some firms reported revenues but failed to report the number of employees.

centres of small cities are not significantly different from zero. In fact, neither the real revenues nor the employment of incumbent firms in city centres are affected by the entry of external shopping malls. This finding suggests that it is easy to confuse the impacts of a long-term negative trend in labour productivity, real revenues and employment with a negative impact caused by the establishment of new external shopping malls.

The Akaike information criterion indicates that Model 2 is the best fit, which further confirms that both firm- and time-specific fixed effects should be included to properly identify the entry effect of external shopping malls.

Validity and Robustness Checks

A key assumption in our difference-in-differences identification strategy is that the trends in our main outcome variable, labour productivity (Y_{it}), would have been parallel in treated and control cities in the absence of treatment. This assumption is impossible to test formally, but to give an indication of its validity, we follow Arcidiacono et al. (2020) and estimate an event study specification to investigate the trends in the outcome variable in the treated cities before and after the entry of external shopping malls. If the treated and control cities have similar trends prior to entry, then we fail to reject the parallel trends assumption. For this event study, we first exclude the control cities from our dataset. Then, for the treated cities, that is, those in which new external shopping malls entered during our study period, we standardize the year variable so that the entry year is equal to zero. Hence, we obtain a dataset with 14 years before entry and 14 years after entry for our analysed sample of small cities. We then estimate the following regression model

$$\ln Y_{it} = \beta_0 + \sum_{t=-14}^{14} \beta_{std\_t} \times \vartheta\_std_t + \vartheta_t + \gamma_i + \varepsilon_{it} \qquad (4)$$

where ϑ_std_t denotes standardized years such that the specification allows the β_{std_t} estimates to be interpreted as the effect on labour productivity for every standard year, both before and after entry. With all entry cities sharing a common entry year (at standard year = 0), we can now illustrate the trends in the effects on the output variable (i.e. labour productivity) by standard year, before and after the establishment of external shopping malls, for both Model 1 (without time-specific fixed effects (ϑ_t)) and Model 2 (with time-specific fixed effects (ϑ_t)); see Figure 2 and Table A1 in Appendix 1.

In Figure 2(a), which corresponds to a model without correction for time trends, the parameter estimates are negative and seem to trend slightly downwards even before entry (i.e. before standard year = 0). This result indicates that incumbents in entry cities had lower levels of productivity and were on a more negative growth path even before the entry of external shopping malls. However, note that the year-by-year differences in the levels of labour productivity between the entry and control cities are not statistically significant in the pre-entry periods.
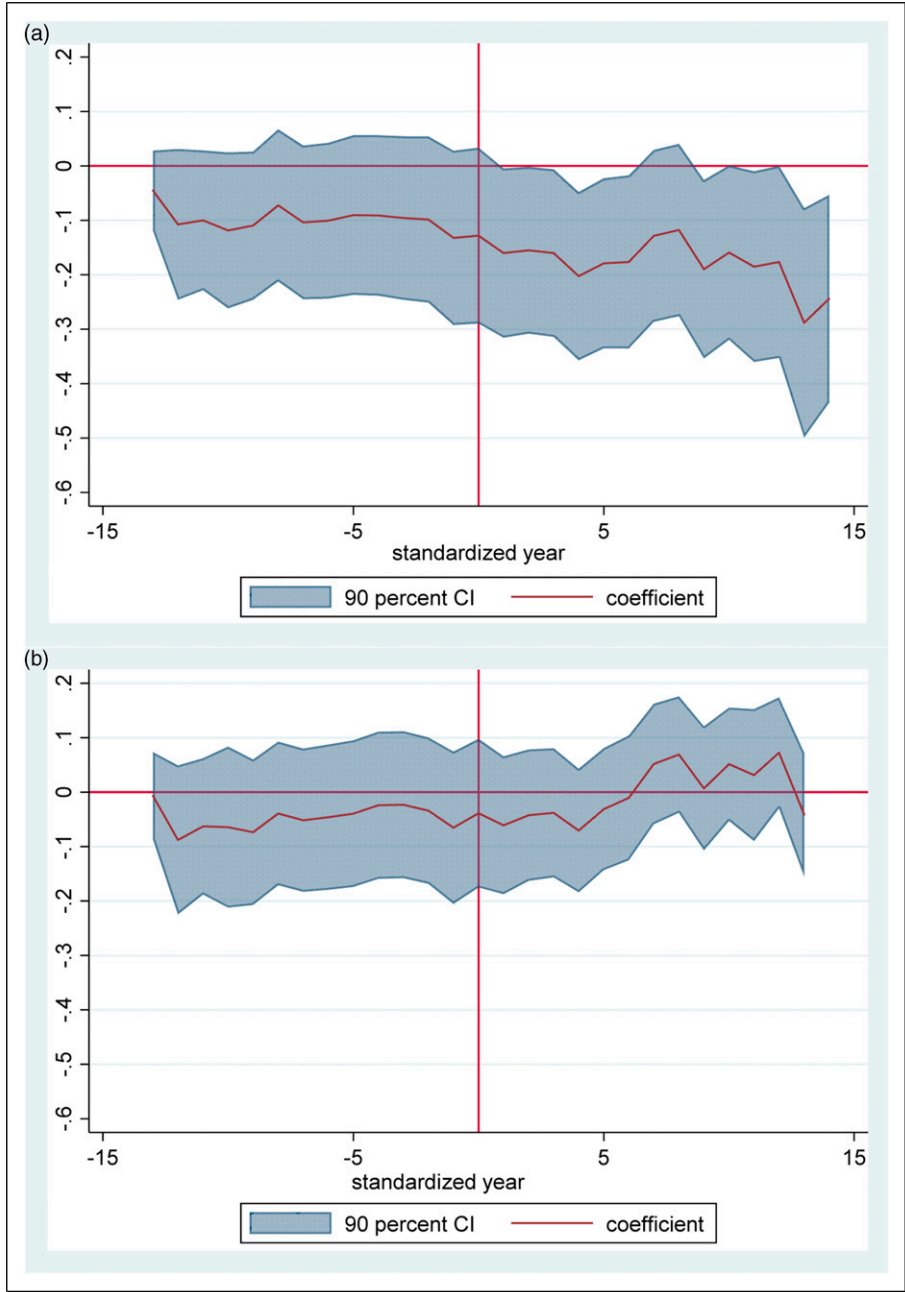
Figure 2. Trends in the effects on labour productivity in entry cities by standardized year – the model without time fixed effects (a) and the model with time fixed effects (b).

Figure 2(b), corresponding to the model with time-specific controls, clearly indicates that before entry (i.e. before standard year = 0), the estimates are not statistically significant, as the confidence intervals overlap the zero line on the *x*-axis. This result implies that the pre-entry trends in entry and control cities for labour productivity, the main output variable in our study, are similar. The insignificant pre-entry trends correspond to the standardized years −13 to −1 in Table A1 (Appendix 1), columns 4 and 5.

As neither the graphs nor the data in Table A1 (Appendix 1) offer a clear argument for or against significant pre-entry trends, we check the existence of differences in pre-entry trends between entry and control cities by regressing the parameter estimates (P_t) from Models 1 and 2, respectively, on a trend variable for the standard years corresponding to the period before entry

$$P_t = \beta_0 + \beta_{\text{trend}} \times \text{trend} + u_t \qquad (5)$$

The results indicate that β_{trend} is small but negative and significant at the 90% level for the estimates from Model 1, while it is insignificant for the estimates from Model 2. This result confirms our conclusion that Model 1 shows a difference in trends violating the parallel trends assumption for difference-in-differences estimations. In contrast, in Model 2, after the inclusion of the time-specific fixed effects, no such difference in trends is observed.

After the entry of external shopping malls, we observe a decline in labour productivity for the results corresponding to Model 1 (without time-specific fixed effects, Figure 2(a) and Table A1 (columns 2 and 3) in Appendix 1). In other words, some but not all coefficient estimates become negative and significant (Figure 2(a) and columns 2 and 3 in Table A1, Appendix 1) after the entry point. However, when controls are included for time trends (Figure 2(b) and columns 4 and 5 in Table A1, Appendix 1), the coefficient estimates are not statistically significant from zero after entry, confirming our main result that any negative effects on incumbent firms in city centres are not due to the entry of external shopping malls.

Discussion

When shopping malls enter the outskirts of small cities, their range may overlap with that of incumbent firms located in city centres. Their larger size and wider offer, often focused on higher-order goods, make external shopping malls more attractive and give them a competitive advantage over firms in city centres. However, these negative competition effects might be offset by positive agglomeration effects. External shopping malls typically attract customers from farther away, which might result in positive spillover effects on firms located in city centres.

Unfortunately, few studies have investigated the effects of shopping malls on incumbent firms in small cities. Instead, previous studies have been based on the entry of big-box stores in larger cities, which is problematic because the customer base in small cities is more limited, implying that external shopping malls may claim much of the city centre's old customer base. Furthermore, despite the small distances between the city centres and external shopping malls in these cities (generally under 1 km or approximately

0.6 miles), such positive spillovers are likely to be quite limited. At the same time, positive spillover effects due to agglomeration economies are also less likely to be strong in small cities because smaller city centre incumbents may not always have the resources necessary to capture knowledge spillovers and because the local labour pool is quite limited.

The limited number of studies that have investigated the development of incumbent firms in small cities following the entry of external shopping malls are typically case studies based on qualitative data; hence, they are unsuitable for drawing causal inferences. We have contributed to the literature by investigating how incumbent firms in city centres were affected by the entry of 17 external shopping malls on the outskirts of small cities in Sweden. We have thus treated these entries as a natural experiment and estimated their effects on incumbent firms by applying a difference-in-differences model that accounts for both firm-specific heterogeneity and time trends. Controlling only for firm-specific fixed effects and ignoring the impact of time trends, we found that incumbent firms experienced a productivity loss of 5.31% due to the entry of external shopping malls. However, when we also accounted for time trends in the regression specification, all negative effects of external shopping malls on incumbent firms became insignificant.

Our results suggest that new external shopping malls per se do not negatively impact the performance of firms located in small cities; rather, the effect occurs as a result of more general economic trends that these small cities have been experiencing for some time. The downward development path of small cities is not surprising. Rodrígues-Pose (2018) argued that for a long time, such places have been regarded as 'places that do not matter' and are characterized by economic decline and a lack of opportunities and, as a consequence, investments. These places lag behind others because economic dynamism is increasingly related to large urban areas, implying that small cities in general have poor economic prospects for the future.

Our findings challenge the results of earlier studies based on, for example, post-entry surveys (e.g. Abdelghani 2013; Howard and Davies 1993), which conclude that large shopping malls negatively impact firms in city centres. These studies are based on qualitative research methods or more general regression models that do not account for time trends. Our results highlight the importance of distinguishing the impacts of long-term negative trends from the negative impacts caused by the establishment of new external shopping malls. Consequently, we suggest that rather than supporting laws to prevent the establishment of external shopping malls, policy makers should focus more on finding the hidden potential of these small places and facilitating more opportunities for small cities to become competitive. External shopping malls can even become an integrated part of this process through collaboration with city centres.

Reversing this 'spiral of decline' in the small city centre is argued to be feasible if large enough regenerative responses such as, for example, in-town shopping malls, are implemented within traditional centres (Thomas and Bromley 2002). Lowe (2005a, 2005b) argues that such retail-based strategies for the regeneration of the city centre may be strategically vital for the survival of the city. Based on several studies of the city of Southampton, United Kingdom, she argues that such strategies generate considerable synergy between the new in-town shopping malls and the city's existing centre.

Furthermore, such developments have the potential to contribute to the initiation of even more investments in the central district and thus a decrease in the vacancy rates. This may further lead to the regeneration and rebranding of the central areas, and consequently to an improvement in the perception of the city as a retail and leisure destination.

A comparative approach relative to the new shopping malls may be prolific in this respect. While some retail types choose to move to the newly established shopping centre (Crosby et al. 2005), maintaining a substantial function in comparison goods (such as groceries, bakeries, drug and healthy food stores), offering enough diversity and maintaining a social role can be of outmost importance for the traditional city centre (Popp 2014; Thomas and Bromley 2002; Wrigley et al. 2009). Retaining consumer demand within the city appears, on that account, to be vital in this context (Delage et al. 2020).

Note, however, that the relative power of these small city centres to attract customers may be quite limited compared to that of new and larger shopping malls. This means that the customer flow may be unidirectional, from the former to the latter, rather than vice versa (Thomas and Bromley 2003). Shopping centres can thus create a market area by themselves. This means that the original goal of enlarging the retailer selection of the town centre by establishing shopping within close distance does not always create a more attractive location altogether (Popp 2014). The distance decay for the positive spillovers may in these cases be very abrupt. This sharp decay is evidenced by positive developments in the immediate geographical space adjoining the new malls, while areas beyond their immediate vicinity (including the traditional main streets) are not affected. These areas are increasingly dominated by vacant space, charity stores and discounters and thus become even more vulnerable to further retail shocks, as for example competition from other neighboring markets (Crosby et al. 2005).

We have focused on the development of small cities since they have been particularly affected by urbanization and lack of investment during the last decades. This raises the question of whether the competitive advantage that external shopping centres may have implies more negative effects for retailers in this group of cities. While restricting the analysis to a sample of similar units (i.e. small cities) may contribute to the internal validity of our research, we are aware that it moderates its external validity; however, focussing on small cities is of importance from the point of view of policy making. Our results contribute to the debate about whether it is external retailing or rather long-term ur-banization and disinvestment trends that are responsible for the actual situation in the city centres, and this is particularly relevant for urban policy in countries with a large number of relatively small localities, such as Sweden. We also believe that more research is needed to examine the effects of local policies enacted to increase the attractiveness of small cities facing competition from external shopping centres, such as business improvement dis-tricts (Michel and Stein 2015; Wahlberg 2016). It has been argued that these policies have the power to attract both residents and capital to the city centres of smaller cities, thus increasing their potential to benefit from agglomeration spillovers and simultaneously withstand competition from surrounding markets. If data on which cities that have implemented business improvement districts could be made available, investigating the efficacy of such policies would be an interesting avenue for future research.

Appendix

Table A1. Trends in the Effects on Labour Productivity by Standardized Year in the Entry Cities.

	without time FE		with time FE	
standardized year	coefficient	*p*-value	coefficient	*p*-value
standardized year −13	−0.045	0.312	−0.007	0.892
standardized year −12	−0.108	0.202	−0.088	0.291
standardized year −11	−0.100	0.201	−0.063	0.409
standardized year −10	−0.119	0.174	−0.064	0.475
standardized year −9	−0.110	0.185	−0.074	0.363
standardized year −8	−0.072	0.394	−0.039	0.625
standardized year −7	−0.104	0.227	−0.052	0.519
standardized year −6	−0.101	0.248	−0.046	0.570
standardized year −5	−0.090	0.311	−0.039	0.629
standardized year −4	−0.091	0.310	−0.024	0.768
standardized year −3	−0.096	0.295	−0.023	0.777
standardized year −2	−0.099	0.288	−0.034	0.677
standardized year −1	−0.132	0.175	−0.065	0.442
entry year	−0.128	0.193	−0.039	0.642
standardized year 1	−0.160*	0.091	−0.061	0.429
standardized year 2	−0.155*	0.096	−0.042	0.565
standardized year 3	−0.160*	0.088	−0.038	0.599
standardized year 4	−0.203**	0.031	−0.071	0.305
standardized year 5	−0.179*	0.060	−0.031	0.647
standardized year 6	−0.176*	0.068	−0.011	0.879
standardized year 7	−0.129	0.181	0.052	0.442
standardized year 8	−0.118	0.221	0.069	0.288
standardized year 9	−0.190*	0.057	0.007	0.919
standardized year 10	−0.159	0.102	0.051	0.417
standardized year 11	−0.185*	0.082	0.031	0.671
standardized year 12	−0.176	0.100	0.072	0.243
standardized year 13	−0.288**	0.025	−0.041	0.549
standardized year 14	−0.244**	0.035		

* significant at the 0.1 level; **significant at the 0.05 level.
Note: standardized year −14 is considered the base year and is thus omitted from the regression model.

Declaration of Conflicting Interests

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Notes

1. Although the population growth levels differ considerably between different categories of cities in Sweden, the fact that we mainly observe positive population trends regardless of city type and size is explained by an influx of immigrants from mainly Middle Eastern countries affected by war, particularly Syria. Almost 1.8 million immigrants entered Sweden in the 2000–2017 period, and the Swedish population was 10.3 million in 2019 (SCB 2020).
2. Our dataset is not ideally suited for identifying entry and exit. The only way to identify entry and exit is by recording when a specific organization number for a retail firm appears in or leaves the dataset. However, there can be a number of reasons for this other than the formal entry or exit of a retail firm. For example, if a firm is sold, it is often but not always the case that the firm is registered with a new organization number. Thus, we are unable to analyze the effects of new shopping malls on firm entry and exit in the entry regions.
3. Several other studies that focused on the relationship between shopping malls and incumbent businesses fall beyond the scope of our study. For example, Dart (1988) investigated small retailers that relocate to new shopping malls. Lowe (2005a, 2005b), Maronick (2007), Maronick and Stiff (1985) and Whysall (1995, 2011) investigated entry by large city centre stores and shopping malls as retail-led urban regeneration strategies in response to the problems associated with the proliferation of external shopping malls. Chen et al. (2010) proposed a method to determine the optimal location choice for new shopping malls based on their possible impacts. In addition, Delic and Knezevic (2014) comparatively described the development of shopping malls in countries in Southeast Europe.
4. For more information, visit https://www.espon.eu/topics-policy.
5. The minimum levels for each city are the result of a workshop with representatives of academic institutions, industry associations, city officials, property owners, consulting companies, retailers and the hospitality industry.
6. Two different external shopping malls were established in Norrtälje during our study period. As we want to identify what happens when a small city that previously did not have access to external shopping acquires such a mall, we focus solely on the first entry (Knutby Torg, established in 2005) in our statistical analysis. Notably, the second entry (Flygfältets Handelsområdet, 2012) was considerably smaller and entered quite late in our study period, thus making it unlikely that we could identify any additional effects of that entry in our statistical analysis.

7. A precise entry year is not indicated in the original database for five other retail parks that were established in some of our analysed cities. After contact with city officials, we found that these shopping malls were established long before the start of our study period and would thus not be included in our treatment group. Two more centres entered in 1990 and 1995 and were thus also not included in the treatment group in our study. Following Daunfeldt et al. (2019), we assume that the entry areas arrived at a new equilibrium level of sales after every entry. Therefore, older entries should not cause any trends in the key variables that could potentially confound the identification of the impact of external shopping on incumbents in city centres during the study period.

8. As we link firm performance indicators to firm location, we are compelled to restrict our study to firms reporting performance indicators at the establishment level and exclude multi-establishment firms reporting performance indicators only at the headquarters level. However, our data show that approximately 90% of all firms in our sample are single-establishment firms.

9. That treatment cities have very similar development paths over time can be illustrated by, for example, demographic trends. The difference between the annual population growth for the small cities with external shopping centres considered in our study (i.e. the treatment cities) and the annual population growth for the mall cities without external shopping centres (i.e. the control cities) is only 0.13% for the study period (2000–2016).

10. For an introduction to fixed effects models, see Gujarati (2003, Chapter 16).

References

Abdelghani, Montasser I. M. 2013. "The Impact of Shopping Malls on Traditional Retail Stores in Muscat: Case Study of Al Seeb Wilayat." In *Regionalizing Oman: Political, Economic, and Social Dynamic*, edited by Steffen Wippel, 227-247. Dordrecht: Springer.

Ailawadi, Kusum L., Jie Zhang, Aradhna Krishna, and Michael W. Kruger. 2010. "When Wal-Mart Enters: How Incumbent Retailers React and How This Affects Their Sales Outcomes." *Journal of Marketing Research* 47: 577-593. doi: 10.1509/jmkr.47.4.577.

Amcoff, Jan. 2003. "Regional Befolkningsomfördelning Bland Unga och Gamla." Institute for Future Studies, Report No. 2003:13.

Arcidiacono, Peter, Paul B. Ellickson, Carl F. Mela, and John D. Sigleton. 2020. "The Competitive Effects of Entry: Evidence from Supercenter Expansion." *American Economic Journal: Applied Economics* 12 (3): 175-206. doi: 10.1257/app.20180047.

Artz, Georgeanne M., and Kenneth E. Stone. 2012. "Revisiting Wal-Mart's Impact on Iowa Small-Town Retail: 25 Years Later." *Economic Development Quarterly* 26: 298-310. doi: 10.1177/0891242412461828.

Balsas, Carlos J. L. 2014. "Downtown Resilience: A Review of Recent (Re)developments in Tempe, Arizona." *Cities* 36: 158-169. doi: 10.1016/j.cities.2012.10.002.

Basker, Emek. 2007. "When Good Instruments Go Bad: A Reply to Neumark, Zhang, and Ciccarella." University of Missouri - Columbia Working Paper No. 0706.

Bromley, Rosemary D. F., and Colin J. Thomas. 1995. "Small Town Shopping Centre Decline: Dependence and Inconvenience for the Disadvantaged." *The International Review of Retail Distribution and Consumer Research* 5: 433-456. doi: 10.1080/09593969500000025.

Brown, Stephen. 1989. "Retail Location Theory: The Legacy of Harold Hotelling." *Journal of Retailing* 65: 450-470.

Chen, Vivien Y. C., Chiu-Hua Liu, Gwo-Hsiung Tzeng, Ming-Huei Lee, and Lung-Shih Yang. 2010. "Comnining DEMATEL and ANP with the Grey Relational Assessment Model for Improving the Planning in Regional Shopping Centers". In *Advances in Intelligent Decision Technolgies: Smart Innovation, Systems and Technologies*, edited by Gloria Phillips-Wren, Lakhmi C. Jain, Kazumi Nakamatsu, and Robert J. Howlett, Vol. 4, 709-719. Berlin, Heidelberg: Springer.

Christaller, Walter. 1933. *Central Places in Southern Germany.* Englewood Cliffs, N.J.: Prentice Hall.

Crosby, Neil, Cathy Hughes, Colin Lizieri, and Melanie Oughton. 2005. "A Message from the Oracle: The Land Use Impact of a Major In-town Shopping Centre on Local Retailing". *Journal of Property Research* 22 (2-3): 245-265. doi: 10.1080/09599910500453848.

Dart, Jack. 1988. "Power, Conflict, And Satisfaction: Perceptions of Shopping Center Based Small Retailers." *American Journal of Small Business Winter* 12 (3): 35-44. doi: 10.1177/104225878801200303.

Daunfeldt, Sven-Olov, Oana Mihaescu, Helena Nilsson, and Niklas Rudholm. 2019. "Spillover Effects When IKEA Enters: Do Local Retailers Win or Lose?" *Papers in Regional Science* 98 (6): 2295-2313. doi: 10.1111/pirs.12459.

Delage, Matthieu, Sophie Baudet-Michel, Sylvie Fol, Sophie Buhnik, Hadrien Commenges, and Julie Vallée. 2020. "Retail Decline in France's Small and Medium-sized Cities over Four Decades. Evidences from a Multi-level Analysis." *Cities* 104 (2): 102790. doi: 10.1016/j.cities.2020.102790.

Delic, Mia, and Blazenka Knezevic. 2014. "Development of Shopping Centers in Central and Southeastern Europe." In *Danube Adria Association for Automation and Manufacturing International Scientific Book*, edited by Branko Katalinic, 471-484, Vienna, Austria: DAAAM International.

Drewianka, Scott, and Dain Johnson. 2006. "Wal-Mart And Local Labor Markets, 1990-2004." University of Wisconsin Working Paper.

Ellickson, Paul B., and Paul L. E. Grieco. 2013. "Wal-Mart and the Geography of Grocery Retailing." *Journal of Urban Economics* 75: 1-14. doi: 10.1016/j.jue.2012.09.005.

Erkip, Feyzan, and Burcu H. Özüduru. 2015. "Retail Development in Turkey: An Account after Two Decades of Shopping Malls in the Urban Scene." *Progress in Planning* 102: 1-33. doi: 10.1016/j.progress.2014.07.001.

European Spatial Planning Observation Network (ESPON). 2014. "European Observation Network on Territorial Development and Cohesion." Report CCI 2007 CB 163 PO 022. https://www.espon.eu/topics-policy.

Farhangmehr, Minoo, Susana Marques, and Joaquim Silva. 2001. "Hypermarkets versus Traditional Retail Stores - Consumers' and Retailers' Perspectives in Braga: A Case Study." *Journal of Retailing and Consumer Services* 8 (4): 189-198. doi: 10.1016/S0969-6989(00)00020-5.

Forsberg, Håkan. 1998. "Institutions, Consumer Habits and Retail Change in Sweden." *Journal of Retailing and Consumer Services* 5(3): 185-193. doi: 10.1016/S0969-6989(96)00063-X.

Foster, Lucia, John Haltiwanger, and C. J. Krizan. 2006. "Market Selection, Reallocation and Restructuring in the U.S. Retail Trade Sector in the 1990s." *Review of Economics and Statistics* 88: 748-758. doi: 10.1162/rest.88.4.748.

Freedman, Matthew L., and Rénata Kosová. 2012. "Agglomeration, Product Heterogeneity and Firm Entry." *Journal of Economic Geography* 12 (3): 601-626. doi: 10.1093/jeg/lbr022.

Ghosh, Avijit, and Sara L. McLafferty. 1987. *Location Strategies for Retail and Service Firms*. Lexington, MA: Lexington Books.

González-Benito, Javier, and Óscar González-Benito. 2005. "Environmental Proactivity and Business Performance: An Empirical Analysis." *Omega* 33: 1-15. doi: 10.1016/j.omega.2004.03.002.

Greenstone, Michael, Richard Hornbeck, and Enrico Moretti. 2010. "Identifying Agglomeration Spillovers: Evidence from Winners and Losers of Large Plant Openings." *Journal of Political Economy* 118: 536-598. doi: 10.1086/653714.

Guimarães, Pedro P. 2014. "The Prospective Impact of New Shopping Centers On the Retail Structure of Braga." *Bulletin of Geography: Socio-Economic Series* 25: 167-180. doi: 10.2478/bog-2014-0037.

Gujarati, Damodar N. (2003). *Basic Econometrics*. 4th ed. New York, NY: McGraw-Hill.

Haltiwanger, John, Ron R. Jarmin, and C. J. Krizan. 2010. "Mom-And-Pop Meet Big-Box: Complements or Substitutes?" *Journal of Urban Economics* 67: 116-134. doi: 10.3386/w15348.

Han, Mengjie, Oana Mihaescu, Yujiao Li, and Niklas Rudholm. 2018. "Comparison and One-Stop Shopping After Big-Box Retail Entry: A Spatial Difference-In-Difference Analysis." *Journal of Retailing and Consumer Services* 40: 175-187. doi: 10.1016/j.jretconser.2017.10.003.

Heffner, Krystian, and Małgorzata Twardzik. 2015. "The Impact of Shopping Centers in Rural Areas and Small Towns in The Outer Metropolitan Zone: The Example of The Silesian Voivodship." *European Countryside* 2: 87-100. doi: 10.1515/euco-2015-0006.

Henderson, J. Vernon, Zmarak Shalizi, and Anthony J. Venables. 2001. "Geography and Development." *Journal of Economic Geography* 1: 81-105. doi: 10.1093/jeg/1.1.81.

Hicks, Michael J., Stanley R. Keil, and Lee C. Spector. 2012. "Mom-And-Pops or Big-Box Stores: Some Evidence of Wal-Mart Impact on Retail Trade." *Economic Development Quarterly* 26 (4): 311-320. doi: 10.1177/0891242412463817.

Hotelling, Harold. 1929. "Stability in Competition." *The Economic Journal* 39 (153): 41-57.

Howard, Elizabeth B., and Ross L. Davies. 1993. "The Impact of Regional, Out-Of-Town Retail Centres: The Case of the Metro Centre." *Progress in Planning* 40: 89-165. doi:10.1016/0305-9006(93)90005-E.

Jia, Panle. 2008. "What Happens When Wal-Mart Comes to Town: An Empirical Analysis of The Discount Retailing Industry." *Econometrica* 76: 1263-1316. doi: 10.3982/ECTA6649.

Jones, Ken, and Michael Doucet. 2000. "Big-Box Retailing and the Urban Retail Structure: The Case of the Toronto Area." *Journal of Retailing and Consumer Services* 7 (4): 233-247. doi: 10.1016/S0969-6989(00)00021-7.

Kickert Conrad and Rainer vom Hofe. 2018. "Critical Mass Matters: The Long-term Benefits of Retail Agglomeration for Establishment Survival in Downtown Detroit and The Hague." *Urban Studies* 55 (5): 1033-1055. doi: 10.1177/0042098017694131.

Lee, Jinhyung, and Youngho Kim. 2018. "'A Newcomer' versus 'First Mover': Retail Location Strategy for Differentiation." *The Professional Geographer* 70 (1): 22-33. doi: 10.1080/00330124.2017.1310621.

Lee, Yuk, and Michael McCracken. 2012. "Centripetal and Centrifugal Movement: Shopping Centres in Denver, USA, and Brisbane, Australia." *Urban Studies* 49 (7): 1489-1506. doi: 10.1177/0042098011415714.

Lowe, Michelle. 2005a. "The Regional Shopping Centre in The Inner City: A Study of Retail-Led Urban Regeneration." *Urban Studies* 42 (3): 449-470. doi: 10.1080/00420980500035139.

Lowe, Michelle. 2005b. "Revitalizing Inner City Retail? The Impact of The West Quay Development on Southampton." *International Journal of Retail and Distribution Management* 33 (9): 658-668. doi: 10.1108/09590550510611850.

Maronick, Thomas J. 2007. "Specialty Retail Center's Impact on Downtown Shopping, Dining, and Entertainment." *International Journal of Retail and Distribution Management* 35 (7): 556-568. doi: 10.1108/09590550710755930.

Maronick, Thomas J., and Ronald M. Stiff. 1985. "The Impact of a Specialty Retail Center on Downtown Shopping Behavior." *Journal of the Academy of Marketing Science* 13 (3): 292-306. doi: 10.1007/BF02729951.

Marshall, Alfred. 1890. *Principles of Economics*. London: McMillan and Co.

McCann, Philip. 2001. *Urban and Regional Economics*. Oxford: Oxford University Press.

Michel, Boris, and Christian Stein. 2015. "Reclaiming the European City and Lobbying for Privilege: Business Improvement Districts in Germany." *Urban Affairs Review* 51 (1): 74-98. doi: 10.1177/1078087414522391.

Monheim, Rolf. 1998. "Methodological Aspects of Surveying the Volume, Structure, Activities and Perceptions of City Centre Visitors." *GeoJournal* 45: 273-287. doi: 10.1023/A:1006959927988.

Newmark, David, Junfu Zhang, and Stephen Cicarella. 2008. "The Effect of Wal-Mart on Local Labor Markets." *Journal of Urban Economics* 63: 405-430. doi: 10.1016/j.jue.2007.07.004.

Nordic Council of Shopping Centers (NCSC). 2017. "Swedish Shopping Center Directory." https://www.sscd.se.

Öner, Özge. 2014. "Retail Location." Jönköping International Business School Dissertation Series Dissertation No.097.

O'Sullivan, Arthur. 2003. *Urban Economics*. New York, NY: McGraw-Hill/Irwin.

Özçelik, Seda E. 2020. "Evaluation of Firm Performances in Emerging Markets." In *Handbook on Research on Increasing the Competitiveness of SMEs*, edited by Rafael Perez-Uribe, David Ocampo-Guzman, Carlos Salcedo-Perez, Lorena Pineiro-Cortes, and Maria D. P. Ramirez-Salazar, 329-354. Hershey, PA: IGI Global.

Özüduru, Burcu H., Cigdem Varol, and Özge Yalçiner Erkoşkun. 2014. "Do Shopping Centers Abate the Resilience of Shopping Streets? The Co-Existence of Both Shopping Venues in Ankara, Turkey." *Cities* 36: 145-157. doi: 10.1016/j.cities.2012.10.003.

Picone, Gabriel, David B. Ridley, and Paul A. Zandbergen. 2008. "Distance Decreases with Differentiation: Strategic Agglomeration by Retailers." *International Journal of Industrial Organization* 27: 463-473. doi: 10.1016/j.ijindorg.2008.11.007.

Pine, B. Joseph, and James H. Gilmore. 1999. *The Experience Economy: Work is Theatre and Every Business a Stage*. Cambridge, MA: Harvard Business Press.

Popp, Monica. 2014. "Developing Shopping Centres in Inner-city Locations: Opportunity or Danger for the Town Centres?" *Die Erde* 135: 107-124.

Porter, Michel E. 1990. *The Competitive Advantage of Nations*. New York, NY: Free Press.

Pratt, Samuel, and Lois Pratt. 1960. "The Impact of Some Regional Shopping Centers." *Journal of Marketing* 25 (2): 44-50. doi: 10.1177/002224296002500208.

Rice, Patricia, Anthony J. Venables, and Eleonora Pattachini. 2006. "Spatial Determinants of Productivity: Analysis for The Regions of Great Britain." *Regional Science and Urban Economics* 36: 727-752. doi: 10.1016/j.regsciurbeco.2006.03.006.

Robertson, Kent A. 1999. "Can Small-City Downtowns Remain Viable?" *Journal of the American Planning Association*, 65 (3): 270-283. doi: 10.1080/01944369908976057.

Rodrígues-Pose, Andrés. 2018. "The Revenge of The Places That Don't Matter (And What to Do About It)." *Cambridge Journal of Regions, Economy and Society* 11 (1): 189-209. doi: 10.1093/cjres/rsx024.

Rudholm, Niklas, Yujiao Li, and Kenneth Carling. 2018. "How Does Big-Box Entry Affect Labor Productivity in Durable Goods Retailing? A Synthetic Control Approach." HUI Research Working Paper No. 130.

Saito, Hisamitsu, and Munisamy Gopinath. 2009. "Plants' Self-Selection, Agglomeration Economies and Regional Productivity in Chile." *Journal of Economic Geography* 9: 539-558. doi: 10.1093/jeg/lbp010.

Singh, Vishal P., Karsten T. Hansen, and Robert C. Blattberg. 2006. "Market Entry And Consumer Behavior: An Investigation of a Wal-Mart Supercenter." *Marketing Science* 25: 457-476. doi: 10.1287/mksc.1050.0176.

Statistics Sweden (SCB). 2020. Befolkningsstatistik. https://www.scb.se/hitta-statistik/statistik-efter-amne/befolkning/befolkningens-sammansattning/befolkningsstatistik/#_Tabellerochdiagram.

Stone, Kenneth E., and James C. McConnon Jr. 1982. "The Effect of Shopping Centers on Host Towns." In Proceedings No. 279191 of the Annual Meeting of the American Agricultural Economics Association, 1-4 August, Logan, Utah, USA.

Thomas, Colin J., and Rosemary D. F. Bromley. 1995. "Retail Decline and the Opportunities for Commercial Revitalisation of Small Shopping Centres: A Case Study in South Wales." *Town Planning Review* 66: 431-452.

Thomas, Colin J., and Rosemary D. F. Bromley. 2002. "The Changing Competitive Relationship between Small Town Centres and Out-of-town Retailing: Town Revival in South Wales." *Urban Studies* 39 (4): 791-817. doi: 10.1080/00420980220119570.

Thomas, Colin J., and Rosemary D. F. Bromley. 2003. "Retail Revitalization and Small Town Centres: The Contribution of Shopping Linkages." *Applied Geography* 23: 47-71. doi: 10.1016/S0143-6228(02)00068-1.

Van Handel, R. J. 1970. "Uncertainty and Retail Location Patterns." *Applied Economics* 2: 289-298. doi: 10.1080/00036847000000036.

Wahlberg, Olof. 2016. "Small Town Centre Attractiveness: Evidence from Sweden." *International Journal of Retail and Distribution Management* 44(4): 465-488. doi: 10.1108/IJRDM-08-2014-0121.

Whysall, Paul. 1995. "Regenerating Inner City Shopping Centers." *Journal of Retailing and Consumer Services* 2 (1): 3-13. doi: 10.1016/0969-6989(95)00005-4.

Whysall, Paul. 2011. "Managing Decline in Inner City Retail Centres: From Case Study to Conceptualization." *Local Economy* 26 (1): 3-17. doi: 10.1177/0269094210391170.

Wolinsky, Asher. 1983. "Retail Trade Concentration Due to Consumers' Imperfect Information." *The Bell Journal of Economics* 14: 275-282. doi: 10.2307/3003554.

Wooldridge, Jeffrey. M. 2010. *Econometric Analysis of Cross Section and Panel Data.* Cambridge, MA: The MIT Press.

Wrigley, Neil, and Dionysia Lambiri. 2014. *High street performance and evolution: a brief guide to the evidence.* Southampton, GB: University of Southampton.

Wrigley, Neil, Julia Branson, Andrew Murdock, and Graham Clarke. 2009. "Extending the Competition Commission's Findings on Entry and Exit of Small Stores in British High Streets: Implications for Competition and Planning Policy." *Environment and Planning A: Economy and Space* 41 (9): 2063-2085. doi: 10.1068/a41326.

Yalçiner Erkoşkun, Özge, and Burcu H. Özüduru. 2010. "The Relation Between Retail Activity Transformation and Social Sustainability: A Case Study of Bahcelievler 7th Street, Ankara/ Turkey." In Proceedings of the 14th International Planning History Society Conference, 12-15 July, Istanbul, Turkey.