Retail city: the Relationship between Place Attractiveness and Accessibility to Shops

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RETAIL CITY

The relationship between place attractiveness and accessibility to shops

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Abstract

This paper explores the role of retailers as an urban amenity. Using data for Swedish rural and city municipalities for 2002–2008, 'accessibility to shops' measures are constructed for the shops in the municipalities and in the hosting regions separately to examine the relationship between consumption possibilities and place attractiveness in a spatial continuum. Place attractiveness is proxied by a Q ratio for Swedish housing investment based on Tobin's Q. Access to stores within municipal market boundaries is found to be relevant for the place attractiveness of city municipalities, whereas no such relationship is evident for rural municipalities.

Keywords: Housing, Urban amenities, Retail, Q theory, Regional hierarchy

JEL codes: L81, R12, R31, R14

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1. Introduction

The traditional approach views urban and rural development as the consequence of spatial distribution and uses of the traditional factors of production (land, labor and capital). This approach is challenged by relatively recent studies. Such studies emphasize the importance of consumption possibilities and urban amenities to the growth and development of cities and regions (Lloyd and Clark, 2001; Clark et al., 2002; Clark, 2003a, 2003b). Urban public authorities and actors in the private sector have begun to focus their attention on enhancing the attractiveness of their location to attract future residents, tourists, conventioneers, and retail consumers. It is argued that as firms and individuals become more mobile, the role of consumption possibilities in a city grows, forming an attractive attribute (Glaeser et al., 2001).

This paper aims to address the relevance of consumption possibilities to the attractiveness of a place, with a focus on the role of retail shops as an urban amenity. The paper also presents an empirical exercise addressing spatial equilibrium in an open city system. The theoretical framework for a static spatial equilibrium across cities suggests that (in equilibrium) housing prices should reflect people's willingness to reside in a place and should be explained by wage levels under the assumption that all places offer identical opportunities to their residents (e.g., Roback, 1982). But previous research shows that in some cities housing prices increase more rapidly than wage levels (Glaeser, 2001). This finding implies that people are willing to pay a premium for certain locations with respect to how much money they earn. As argued in the Rosen-Roback framework, amenities capture most of the unobserved characteristics that drive the variations in average house prices. In this strand of literature, high-amenity cities are found to grow and develop faster than low-amenity cities. Building on this idea, this paper argues for the importance of the retail sector as an urban amenity. The paper also presents an empirical application that examines the relevance of the retail sector to place attractiveness.

In addition to the discussion of place attractiveness and consumption possibilities, this paper offers two particular empirical novelties. First, the paper utilizes an 'accessibility to shops' measure that allows for an investigation of the available shops in the local market and in the region separately. The measure accounts for consumption possibilities not only in the immediate surroundings of a municipality but also in the hosting region, which then facilitates a discussion of spillover effects and the spatial continuum. Through the orthogonalization of such measures against market size, the relevance of retail shop availability to place attractiveness is discussed, beyond the sheer scale effects arising from the pertinent local economy. The second novelty in the empirical exercise lies in how place attractiveness is depicted. The quantification of the attractiveness of a place and the comparison across several places are onerous tasks. A standard theoretical framework may suggest examining average house prices, as they are acknowledged to reflect the relative demand for residence in a particular city municipality, thus representing a plausible alternative to capturing the relative degree of place attractiveness. Our

empirical application takes one further step and uses a Q ratio for housing investments in Swedish municipalities, constructed based on Tobin's transparent Q theory. Using average house prices on the municipal level may be problematic because the cost of construction could vary across space as housing prices do. By contrast, using the Q ratio allows us to capture excess supply (or demand) for housing and thus accounting for variation in production costs. The empirical design presented in this paper also isolates the effect of time–invariant assets that contribute to place attractiveness (such as natural amenities, historical monuments, climate and coastal borders) by fixed-effect estimations using Swedish data on the municipal level for the years 2002–2008, and the work further controls for the scale of the market, the concentration of leisure services, tax levels and overall labor market conditions. The conversation on place attractiveness and consumption possibilities is also extended to capture the variation across (i) city and (ii) rural municipalities in the empirical design. The results are consistent with a significant relationship between access to shops in the region and place attractiveness in both city and rural municipalities, with the relationship being notably stronger for the former. The relationship between access to shops in close proximity and place attractiveness is evident only in the city municipalities, but this relationship is not evident in the rural parts of the country.

2. Background and motivation

2.1. Retail and place attractiveness

Amenities can be broadly defined as place-specific assets that are known to contribute to a city's or region's attractiveness. Their importance for regional growth and development is emphasized in detail by a large body of literature (Rosen, 1979; Roback, 1982; Ullman, 1954; Brueckner et al., 1999; Glaeser et al., 2001; Clark et al., 2002; Clark; 2003b). Places with attractive assets are found to attract highly skilled individuals (Jacobs, 1961; Brueckner et al., 1999; Florida et al., 2008). A concentration of amenities, arts and culture is found to be relevant to population growth and development in both central markets and peripheral locations (Partridge et al., 2008; Mellander et al., 2011).

What are the pillars of place attractiveness? The aspects associated with place attractiveness can perhaps be summarized based on a few essential elements of a city, such as its architecture, cultural infrastructure, labor market, public services, service sector, and shops. Some of the elements are intrinsic to a place, whereas other elements relate to the size of the market and externalities. Geographic proximity to these elements elevates the quality-of-life aspect of places. In that sense, it is likely that the most important aspect of cities is that they provide individuals with a capacity for social interaction through increased access to people[1], consumer amenities and other types of cultural and

[1] Access to people is essential for interaction between individuals as well as between economic agents, and is crucial for network development (Andersson and Karlqvist, 1976; Lucas, 2001).

historical amenities. In that sense, a *city* (or town) itself can be considered to be a *territorial public good*, as is proposed by Andersson and Andersson (2006). The urban amenity premium is discussed in the previous literature, which finds the assets of cities to contribute to place attractiveness and housing values (Des Rosiers et al., 2000; Glaeser et al., 2005).

How is *retail* relevant to the consideration of place attractiveness? Can we acknowledge retail as an important amenity in cities or regions? Historically, we have experienced a drastic increase in leisure time in advanced nations. Data from many countries show an increase in the share of disposable income that is allocated to the consumption of leisure goods and services (Andersson and Andersson, 2006). With the increased mobility of individuals, the demand for amenities and quality-of-life attributes in space has increased accordingly (Graves and Linneman, 1979; Clark, 2003a). The importance of the increase in leisure expenditure to the entire retail sector is undeniable. For example, Krafft and Mantrala (2006) emphasize that changing consumer needs and increasing interest in the shopping experience have altered the retailing landscape in the 21st century. High-streets in cities became increasingly service oriented, where traditional retail zones became space for leisure consumption (Wrigley and Lambiri, 2014). The act of shopping is also increasingly associated with the concept of enjoyment and experience (Jin and Sternquist, 2004). Consumers' desire to patronize a retail destination is found to be associated with how they perceive the physical environment (Bitner, 1992), and how they value the shopping experience they can derive from a retail center (Hart et al., 2007). Arguably, the role of retailers as the providers of goods for utilitarian purposes has become more complex following consumers' increasing appreciation for diverse consumption possibilities in space (Rivera-Batiz, 1988). Shops and other consumer services differ from natural amenities in its physical organization, because they are highly related to the economic performance of cities and agglomerative forces. Recent empirical studies show that urban density facilitates consumption, and cities with urban amenities have grown faster than low–amenity cities (Glaeser et al., 2001).

Considering the amenity role of retailers for place attractiveness requires one to account for not only the presence of stores, but also the 'access' to these stores. In this line of thinking, beyond the utility individuals derive by the act of shopping, they also enjoy indirect benefits associated with the scale of the retail market in close proximity. The presence of stores in a market is primarily driven by the size of the market in terms of the potential demand in the immediate surroundings. However, stores serve not only the residents in close proximity but also consumers travelling from other market locations. Such demand inflow should have a multiplier effect for a city; hence, the effect of retailing on the overall economy and attractiveness of a town can extend beyond the linear relationship between the sector and the size of the respective local market. Thus, for a consumer, the relevant retail market nearly always extends beyond the administratively defined boundaries of the town in which the individual resides.

Shops are like public goods, resembling a historical monument or a park, in terms of contributing to place attractiveness. A consumer does not always need to purchase an item at a given store to enjoy the beautifully displayed shop windows. The vibrant environment provided by the presence of a retail cluster fosters increased interaction in space, which is itself an asset. The concentration of shops in a market attracts visitors from other places (similar to tourist attractions), which has a multiplier effect for the overall local economy. The idea of retailers acting as quasi-public goods requires one to revisit the fundamentals of 'public goods'. In the Tiebout (1956) framework, rational individuals are expected to leave places with less attractive local public goods and move to places with more attractive local public goods. Individuals 'vote with their feet' by migrating to places with more attractive attributes associated with local public goods. For goods to be defined as pure public goods, such goods should be consumed without rivalry or exclusion. But in the case of shops, distance to shops (accessibility) serves as an exclusionary force because a consumer needs to be located within a certain proximity to enjoy the presence of a shop, either directly by consumption, or indirectly via aforementioned contributions to place attractiveness. Some shops, on the other hand, can serve as disamenities. A dwelling close to a large, crowded discount store can have an adverse effect on people's willingness to pay for it. Availability of shops correlate with availability of several other leisure services, since both are first and foremost market size driven. Colocation of retail services and other leisure services is a regularity across space. Arguably, a diverse set of shops in a local market serves as a pull-factor for other services, and customers for these services likewise. Consumers that travel to a retail cluster to patronize shops would be inclined to enjoy other services around, such as restaurants and cafes. Investigation of shops as amenities, which are associated with leisure time consumption, therefore, extends beyond the time spent shopping, and relates to a greater attraction for the local market.

2.2. Spatial externalities and place attractiveness

Spatial externalities are closely tied to the attractiveness of places, and their influence is reflected in the housing market. The depth and breadth of consumer amenities, natural amenities, opportunities in the labor market, and natural and cultural assets attract households to the hosting town or region. Consequently, increased demand for residential space in these places results in higher prices in the housing market (Riviera-Batiz, 1988; Brueckner et al., 1999).

Housing prices are primarily affected by proximity to urban nodes, where agglomerative forces[2] provide individuals with several advantages. For example, densely populated areas relate to greater access to larger job markets with a possible urban wage premium and better labor market matching (Glaeser and Máre, 1994; Ciccone and Hall, 1996; Helsley and Strange, 1990; Andersson et al., 2013; Larsson, 2014). Not only jobs but also nearly all economic activities are distributed across space in a systematic manner. Location theories addressing the systematic variation in the spatial distribution of

[2] The concept of 'agglomeration economies' is introduced in the research of Marshall (1890), who emphasizes the gains from shared inputs and mutual interaction.

economic activities date back to von Thunen (1826). Transportation costs (depending on the distance to the central market) are proposed to be the main determinant of how economic activities with varying interaction intensity are distributed across space, which results in varying land prices. Theories of size and density for urban areas have been further developed by several location theorists following this essential idea (Weber, 1909; Christaller, 1933; Lösch, 1954; Isard, 1956; Beckmann, 1958; Alonso, 1964).

Proximity to the central marketplace and the resulting economic density are important components of place attractiveness. However, the precise identification of what makes a place attractive is a complex task. Some of the attractive assets of a place relate to natural amenities such as open space, parks and green areas, urban forest, farmlands and water covers, which are found to contribute to the location premium that is reflected in housing prices (Cheshire and Sheppard, 1995; Tyrväinen and Miettinen, 2000; Irwin, 2002; Andersson and West, 2006; Gibbons et al., 2014). The earlier literature argues that the spatial heterogeneity in housing prices can—at least to some extent—be explained by these types of local 'open space amenities' (Geoghegan et al., 1997; Cho et al., 2008). However, most of the amenities that are not intrinsic to locations are the products of agglomerative forces and density in space. The agglomeration of private and public services (and goods) is acknowledged to be one of the most important determinants of the variation in housing prices across cities as well as across countries (Dubin and Sung, 1987; Andersson, 1997; Adair et al., 2000; Söderberg and Janssen, 2001; Andersson et al., 2010).

From the household and individual consumer perspective, there are several gains associated with agglomerative forces that also relate to the importance of urban amenities for place attractiveness. Rivera–Batiz (1988) notes that a greater variety in local goods and the consumption of traded goods have a substantial influence on household utility. The provision of public goods and services is also found to be subject to less friction in places with a high degree of localized spillovers (Artle, 1959; Andersson, 1985). For the case of retailing, the concepts of bundling and agglomeration are argued to deliver extra utility, and enhance the consumer experience by elevating attractiveness of retail destinations (Oppewal and Holyoake, 2004; Teller and Reutterer, 2008).

2.3. Spatial equilibrium across cities

The rationale behind the empirical exercise in this paper is derived from a static spatial equilibrium framework (see Roback, 1982), which is extended further to investigate the relevance of accessibility to shops on place attractiveness (reflected in the Q ratio for housing investment). The spatial equilibrium approach has three distinct equilibrium conditions for residents, employers and builders. One of the assumptions for spatial equilibrium across cities is that individuals must be making optimal

choices with regard to their location. Most of the models that address spatial equilibrium across cities assume a single type of individual, which implies that the utility levels across space must be identical[3].

One of the differences between within-city and across-city spatial equilibrium is that we assume wage levels to be constant in the first approach, whereas we acknowledge wage differentials across cities in the second approach. As Glaeser (2008) notes, although productivity differences across space have a great influence on labor demand, for the sake of simplicity, labor demand can be considered exogenous rather than endogenous. In the Rosen-Roback framework for static spatial equilibrium across cities, housing prices are explained by wage levels and by the amenities that are present (Rosen, 1979; Roback, 1982). Roback (1982) discusses how workers are distributed across locations with varying amenities and how this distribution is reflected in wages and housing prices. A representative worker[4] maximizes utility subject to a budget constraint as follows:

$$\max U(x, l^c; s) \ \ subject\ to\ w + I = x + l^c r \qquad (1)$$

where s is the quantity of amenities in his location, x is the composite commodity consumed and l^c is housing (residential land) consumed. In the equation, w denotes the wages, I denotes non–labor income, and r represents the rental payments.

The indirect utility function[5], V, is thus the following:

$$V(w, r; s) = k \qquad (2)$$

This equation implies that wages and rents must be different across cities with varying quantities of amenities to equalize the individual utility in these cities.

The second component of the equilibrium is on the firm's (employer's) side, represented by a production function[6], $X = f(l^p, N; s)$, which consists of l^p, land used in production, and N, the total number of workers in a city[7]. The equilibrium condition for firms is thus the following[8,9]:

$$C(w, r; s) = 1 \qquad (3)$$

[3] The assumption of more than one type of individual makes the computation of equilibrium problematic (see GLAESER, 2008 for further discussion).
[4] All consumers (workers) are assumed to be identical in tastes and skills, and the amount of labor supplied by each unit of labor is assumed to be independent of the wage.
[5] $\partial V/\partial s > 0$ because s is an amenity.
[6] Constant returns-to-scale production function
[7] By assumption, capital is perfectly mobile; thus, it is uninfluenced by amenities. Therefore, the returns to capital will be equal in all places. For this reason, capital is not included in the optimization.
[8] Equation 3 for the equilibrium condition for firms is a unit cost function in which unit cost must equal product price. If unity is not present, then firms would be expected to move their capital to more profitable cities.
[9] In the theoretical framework of Roback (1982), there is a distinction between productive and unproductive amenities. For example, it is argued that C_s can be smaller than zero, implying the cost of an unproductive amenity *(e.g., clean air)*.

Equations 2 and 3 in this framework determine wages (w) and rents (r) as functions of the amenities in place (s). The equations indicate that wages and rents (housing values) can be determined by the interaction of the equilibrium conditions for firms and consumers (or workers), which are the two sides of the market[10].

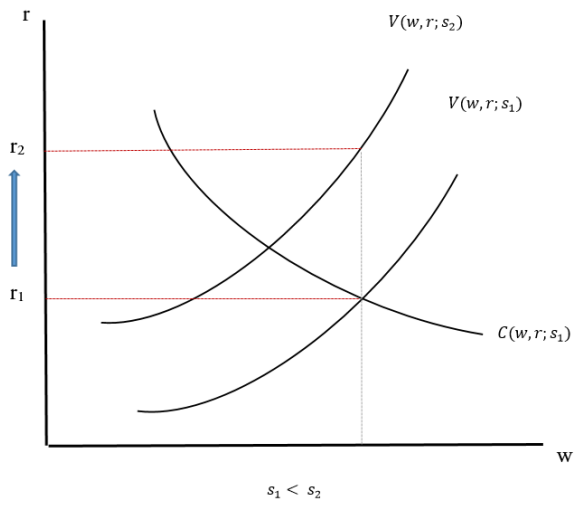

Figure 1: Spatial equilibrium for firms and individuals in places with varying amenities

Figure 1 above (adapted from Roback, 1982) shows the effect of different quantities of amenities in space on wages and rents. The argument is that high rents discourage both firms and workers from being located in an area. Worker equilibrium requires high rents in high–amenity areas to inhibit immigration, whereas firm equilibrium requires low rents in high-amenity areas to justify firm location[11]. The empirical application of this paper exclusively addresses one side of the equilibrium presented in the Roback framework: individuals and the determinants of their location decisions. Figure 1 shows that at a given wage rate, an inward shift in the quantity of amenities will result in an increase in rental (housing) prices. Thus, when holding the wage constant, we should observe a positive effect from the quantity of amenities on housing prices in the respective city.

[10] See Roback (1980) for market-clearing conditions under which wage and rent gradients are influenced by the utility level.
[11] Roback (1982) distinguishes between productive and unproductive amenities. The argument is that when the amenities in an area are productive, the rents would rise, although the change in wages would be ambiguous.

Certain aspects of the framework deserve careful treatment. First, Roback (1982) argues that firms will want to be located in places with lower rental cost, as depicted earlier in the cost function for firms. Given that individuals seek to live in high-amenity places, they must be compensated with higher wages at low-amenity places to achieve the same utility. But the cost function for firms in this framework has strict assumptions. Firms are assumed to operate under constant returns to scale. Additionally, capital is perfectly mobile and will thus be equally profitable in different cities. Although scale-related variables such as population density and population growth are introduced as explanatory variables into the empirical application of this framework by Roback (1982), the theoretical framework itself is rather silent regarding the strong correlation between market size and productivity[12]. However, we know from previous research that there is a strong relationship between market size and productivity, both for firms and for individuals (Ciccone and Hall, 1996; Puga, 2010; Combes et al., 2012; Andersson et al., 2014). Another issue with the framework is that amenities are also assumed to be independent of market size. An implicit assumption of the model is that amenities are exogenously determined (e.g., natural amenities), and available irrespective of the size of a place. For that reason, the positive relationship between market size and consumer amenities such as the size of the retail sector or consumer services is not discussed in this type of framework that deals with spatial equilibrium across cities. However, individuals in high amenity areas -where amenities are endogenously determined by size and purchasing power- should experience a positive relationship between wage and place attractiveness, as proxied by house prices. Places of a certain population density should also impose higher costs of living. This relationship should also be reflected in wages, predicting a direct link between housing costs and wage levels. High-wage places should in this sense bid up local house prices.

[12] Population density, for example, is treated as a form of amenity, the effect of which is expected to be reflected in wage levels in the empirical application of this framework. However, the results for this relationship are found to be insignificant.

3. Data, variables and empirical strategy

3.1. Data

The data used in the study are obtained from Statistics Sweden, and they cover a seven–year period for all Swedish municipalities between 2002 and 2008. The data are used to perform fixed–effect estimations and are used for maps that display the overall spatial patterns prior to the estimation results. The map below serves a descriptive purpose and shows the Swedish municipalities, which represent the respective geographical aggregation used. In Sweden, there are 290 municipalities, each of which belongs to one of 81 local labor markets. The map is shaded with respect to population density in each municipality, and the dots represent the spatial distribution of stores to provide an overview. A store on the map is an establishment that sells a certain type of good, which may or may not belong to a chain. The strong relationship between population density and the availability of stores is evident in the map. We observe a clustering of stores in the southern part of the country, especially around the three metropolitan regions, Stockholm, Malmö and Gothenburg. In addition, the map signals some regional dependencies that require careful treatment in an empirical setting.

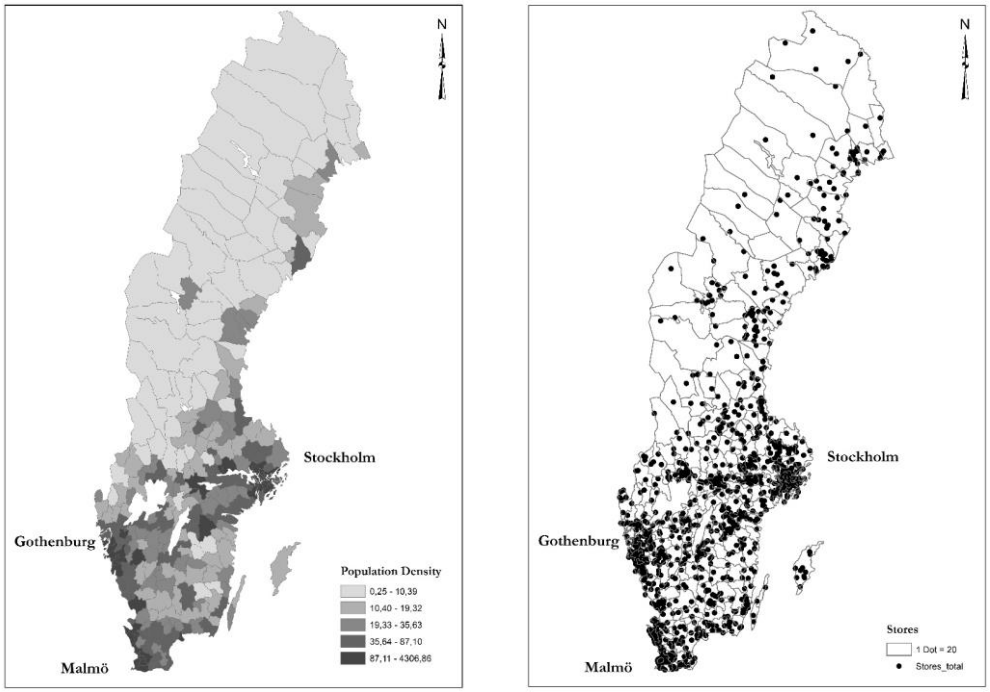

Figure 2a and 2b: Population density (Figure 2a) and the distribution of stores (Figure 2b) across Sweden

3.2. Variables

Q ratio: The theoretical framework relates house prices in a location to that location's attractiveness. Empirical consideration of such approximation requires one to distinguish the effects from house characteristics from the effects that originates from spatially bounded characteristics. Provided with access to micro-data on house prices and characteristics, use of hedonic models allow to separate those effects. The study at hand does not employ such micro-data on house prices and characteristics, but uses city (municipality) level aggregates for house prices. In the absence of micro-data, one method of examining across-city variation in place attractiveness is to investigate average house prices per municipality. Selection of one type of dwelling, as it is done in this study, mitigates problems with aggregation. The study at hand uses only independent house prices as an attractiveness indicator, which makes unobserved characteristics of different types of dwellings found in different parts of the cities much less of a problem for its empirical analysis. Still, municipal averages for house prices per square meter may lead to coarse results if the cost of construction is not adjusted. Because house prices vary across space, the cost to construct a house should also vary because of differences in the composition of residents and in the economic structure of these municipalities. Therefore, instead of using house prices per square meter without any adjustment, the study uses Q ratios for Swedish housing market. The Q ratios used in this study are calculated by Berg and Berger (2006) on the municipal level for the Swedish housing market based on Tobin's Q theory of investment[13].

[13] Despite the appropriateness of Q theory for housing investment, there is only a limited amount of previous empirical work utilizing this theory. (Takala and Tuomala (1990) for Finland and Jud and Winkler (2003) for the US argue that the Q ratio is a

His investment theory builds on the idea that investment should be related to a ratio between the marginal value of capital and the marginal replacement cost (Brainard and Tobin, 1968; Tobin, 1969). The implementation of such a ratio for a homogenous housing market would thus suggest that if the marginal price of a house in the market is higher than its marginal production cost, then construction firms are incentivized to build new dwellings (which would mean that the Q ratio would be greater than 1). Likewise, incentives for production should disappear when Q is equal to or smaller than 1 because of evaporating profit margins. The theoretical framework discusses how house prices should reflect people's willingness to reside in a certain municipality. If we read the Q ratio from this perspective, then we can state that the ratio also reflects excess demand (supply) in a market, where a Q ratio equal to 1 reflects an equilibrium condition. By the same token, a Q ratio larger (or smaller) than 1 implies a state out of equilibrium.

The average Q ratios for Swedish municipalities are calculated by Berg and Berger (2006), who estimate the Q ratio as the ratio between the price index for quality-adjusted prices for owner–occupied houses and construction prices, which are adjusted for subsidies that reduce the production cost. Berg and Berger (2006) calculate the numerator of the Q ratio as the quality-adjusted price per square meter, with the price being adjusted for the age of the house and appreciating by one percent every year since the house was built[14]. A Q ratio higher than one implies excess demand in the respective housing market such that construction firms have an incentive to build new houses because of high profit margins. When Q is equal to one, one can argue that there is an equilibrium situation in the respective market. Likewise, a Q ratio lower than one should imply excess supply such that profit margins evaporate for construction firms. The way the Q ratio signals the state of supply and demand in the housing market in a municipality makes it a good measure to use as a proxy for place attractiveness because it is directly linked to the willingness of people to pay for housing in a municipality while accounting for variations in the cost structure.

The two following maps in Figure 3a and 3b display the variation in Q ratios and the variation in average house prices per square meter across Swedish municipalities. The two variables show an 80 percent correlation, as the similarity between the two map is striking. Although the variables are highly correlated, the maps show small differences in how these values reveal themselves spatially when look at municipalities. For example, taking a closer look at the Stockholm metropolitan region, one can spot that the municipalities with a Q ratio higher than one are not always the ones with the highest average house prices. The map showing the spatial distribution of Q ratios is shaded such that municipalities with a Q value higher than one are colored in black, implying excess demand in their housing market. For such excess demand, only the three metropolitan regions appear to have a notable regional pattern, where several municipalities in the same region have Q ratios larger than one. One can also observe some municipalities with high Q ratios in other parts of the country (e.g., the two major cities in the Northern part, Umeå and Luleå), where economic

significant determinant of housing investment. Jaffee (1994) also reports a positive correlation between the Q ratio and housing investment in Sweden.)

[14] See Berger (2000) for details regarding the calculations of the Q ratio and Berger et al. (2000) for details on the calculation of the present value of housing subsidies.

activity and population density are distinctively higher than the country average. Both maps show that it is possible to observe some municipalities with low Q ratios and low housing values around the *City Municipalities* with high Q ratios and high housing prices despite their relative proximity, except for the three metropolitan regions. This situation signals that the spillover effects generated by the market conditions in the large central city municipalities are sharply attenuated when we examine the municipalities in the bordering regions.

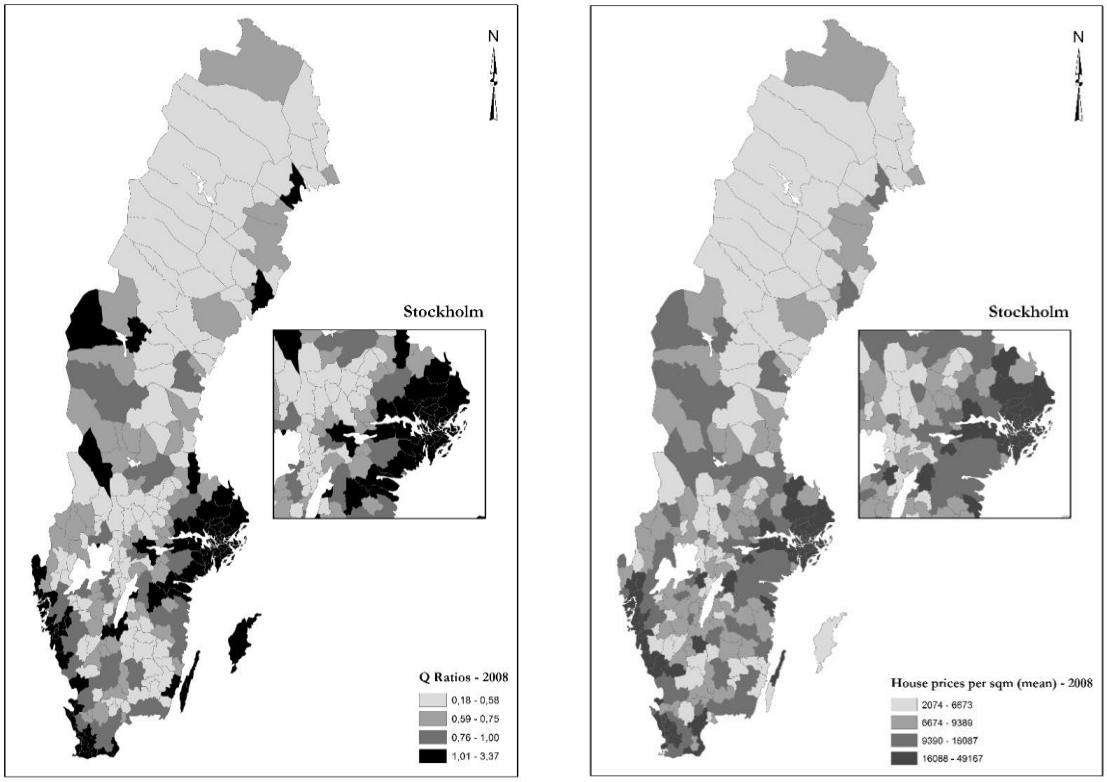

Figure 3a and 3b: The spatial variation in Q values (Figure 3a) and average house prices per sqm (Figure 3b) across Swedish municipalities

Access to shops: The variables representing accessibility to retailers (shops) in municipalities and in regions are the variables of interest. The aim is to capture the relevance of a retail market in close proximity to the attractiveness of cities and rural municipalities. The paper uses an accessibility measure to calculate store potential in a municipality, considering not only the number of stores but also time distances.

Calculations are performed based on the earlier work of Johansson, Klaesson and Olsson (2002), which is further developed by Johansson and Klaesson (2011), investigating the agglomeration dynamics of business services. The total retail accessibility for each municipality can be expressed as shown below in equation 4. By calculating the accessibility to retail, we account for not only the stores in the respective municipalities but also the stores that are located in neighboring municipalities that are hosted in the same region (the 81 Swedish local labor markets). The reason is that, spillover effects across municipal boundaries within the same region almost certainly exist; thus, the total shop accessibility consists of two separate measures, one for access to shops in the respective municipality, and one for access to shops in the region where the municipality is located. We know that for a fair share of retailing activities, the relevant market boundaries extend beyond the municipal borders (Öner, 2016). In equation 4, AS_m^M accounts for intra-municipal retail accessibility, and AS_m^R accounts for intra-regional retail accessibility.

The calculations are performed as shown below, where S_m denotes the number of shops in municipality m and S_R denotes the number of shops in hosting region R, excluding those in municipality m. The distance decay parameters in the equations are denoted by λ, and they have different values for the municipality and the region[15]. The travelling time within the municipality is denoted by t_{mm} , and t_{mR} denotes the traveling time between municipality m and other municipalities in the same region[16].

$$\text{Access to shops in municipality:} \quad AS_m^M = S_m \, e^{\{-\lambda_M t_{mm}\}} \qquad (4)$$

$$\text{Access to shops in region:} \quad AS_m^R = \sum_{R-m} S_R \, e^{\{-\lambda_R t_{mR}\}}$$

Accounting for distance decay is particularly important for this type of framework because it allows us to control for spatial dependencies and to account for a spatial continuum (Andersson and Gråsjö, 2009). The retail markets are not separated with visible boundaries. In fact, with varying sensitivities to distance depending on the type of retailing in question, consumers patronize not only the closest stores but also those that are located farther from their immediate market (Larsson and Öner, 2014). Thus, it is reasonable to assume that the amenity effect from these shops should function in the same manner. The types of consumption possibilities that exist in the region (in excess of the retail potential in a municipality) should also be relevant, especially for city municipalities but less so for rural municipalities.

[15] Distance decay parameters are calculated by Johansson et al. (2002) using real commuting data among the Swedish municipalities.
[16] Avarage travel time by car is used in this calculation.

The regions in the context of this paper are local labor markets in Sweden. A total of 290 Swedish municipalities are grouped under 81 local labor markets. The definition of a local labor market is based on the commuting intensity between municipalities (Johansson et al., 2002; Johansson and Klaesson, 2011). The municipalities with high intensity of commuting between each other are integrated into local labor market regions, and beyond the boundaries of such regions individuals' willingness to commute attenuates sharply. This is why the analysis takes the municipalities and the regional boundaries into account for calculating access to shops.

One problem with such measures is that access to shops in municipality and region are highly correlated with the size of the respective municipal market. Size, as measured in terms of *Population density*, has a correlation with *Access to shops in municipality* of approximately 0.6 and a correlation with *Access to shops in region* of 0.7. As the variables of interest of the study, *Access to shops in municipality* and *Access to shops in region* (denoted as AS_M and AS_R) are highly driven by market size. In large markets (densely populated cities), we naturally observe a larger number of shops. This observation indicates that if one examines the influence of available stores within a certain area on place attractiveness, this influence may merely reflect the size effect. The estimation of a model that introduces market size and access to shops variables as explanatory variables is problematic because of this high correlation between market size and the size of the retail market. This situation challenges any causal claim and risks the robustness of the estimations. Therefore, following the approach[17] proposed by Elton and Gruber (1991), the linear relationship between market size (population density) and retailing in the analysis is eliminated by the orthogonalization of this variable against *Population Density*. Two side regressions are performed for (i) access to shops in the municipality and (ii) access to shops in the region on the *population density* variable, and the residuals[18] of these side regressions are introduced into the empirical model as orthogonalized access to shops variables[19]. Therefore, the results obtained for the retail variable reflect the relevance of retailing for housing prices (place attractiveness) that do not relate to market size. Thus, the coefficients obtained for these two variables should be interpreted as indicating the relationship between access to shops and Q ratio beyond the effects driven by market size.

Over 50 different retailing categories are used for the calculation of this variable. These retailing services can be listed under four main categories with respect to their distance sensitivity to demand. These categories are clothing stores, specialized stores that sell one or few types of items, food retailers, and household stores that sell items for less frequent purchase, all of which have a distinctively different market reach (Klaesson and Öner, 2014). The access to shops variable used in this study is an aggregate variable intended to approximate the consumption possibilities of the locality. I acknowledge, however, that difference in the availability of various types of retailers in urban and rural markets may lead to different results. Although beyond the scope of this paper, such a route is left as a promising avenue for future research.

[17] Application of the orthogonalization approach can also be found in the works of Kim Karlsson (2012) and Hacker et al. (2014).
[18] After discriminating the linear relationship, we observe that the correlation between population density and access to shops in municipality as well as access to shops in region is naturally zero.
[19] Side regressions are performed via pooled OLS estimations.

Population Density: In the work of Roback (1982), population density is introduced to the empirical application as a form of amenity, the effect of which is found to be insignificant (i.e., the effect on wage levels when amenities are held constant). In this paper, population density is treated as a control for market size and is used for the orthogonalization of the *Retail Access* variable. Examining the number of people per square kilometer is much more accurate than accounting for the population as a whole because the influence of population density on housing prices should be much greater than alternative market size measures. It is expected that most of the variation in housing prices will be explained by population density. The variable is not only a size control; it also relates to the scale advantages that are discussed under spatial externalities in the theoretical framework.

Mean Wages: The average wage in a municipality is one of the primary components of the spatial equilibrium framework. The relationship between wage levels and place attractiveness is expected to be positive and significant in all cases and is expected to be stronger for rural municipalities than for city municipalities based on theory, indicating that the demand for residence in low–amenity places should be compensated with a slightly higher wage when controlling for all other factors. The variable is also log transformed.

Leisure service concentration: Establishments providing leisure and recreation–related services are summed and divided by the total number of establishments in a municipality to obtain a measure of the concentration of these services. The services that are included in this variable are hotels, restaurants, bars, movie theatres, arts, fair centers and amusement parks, libraries, museums, sports establishments, and beauty– and wellness–related services. Because leisure service concentration is a share variable, it represents the relative importance of these services with respect to the size of the respective municipality. A scale variable for the size of the leisure market is not possible to introduce due to its high correlation with the retail sector in a locality. Nevertheless, the concentration of leisure services, over and above the size of a municipality and the scale of retailing in the local market, is controlled for by this share variable.

Municipal Tax: Municipal tax rates are expected to exhibit a negative effect on place attractiveness based on 'voting with your feet' types of arguments, such as those found in Tiebout (1956). Rational individuals are expected to leave places with less attractive local public goods and move to places with more attractive local public goods. Higher tax levels may imply a relatively higher cost for what is provided locally and may have a negative effect on place attractiveness. However, tax levels could have a positive relationship with place attractiveness if they are highly correlated with investments in the municipality that contribute to attractive assets in space.

Unemployment share: The share of the population that is unemployed is introduced to the analysis to control for overall labor market conditions. In the Roback (1982) framework, the effect of unemployment on wage levels is found to be consistently insignificant. Thus, a similar result may also emerge in this study for the effect on the Q ratios.

3.3. Empirical strategy

The empirical design of the paper is rooted in the spatial equilibrium framework. Theory suggests that excessive demand in the housing market should reflect a high level of place attractiveness, which is largely a product of a place's amenities. The empirical design provides a regression analysis to determine the actual effect of access to shops on place attractiveness. The variables of interest, *Access to shops in municipality* and *Access to shops in region*, are denoted by AS_M and AS_R, respectively, in the model below. The goal is to capture the relationship between access to retailers (shops) and Q ratios, as they proxy for place attractiveness in the respective Swedish municipalities and are denoted by Q in the model. Market scale is controlled by *Population Density*, denoted by PD. As part of the theoretical framework, average wage levels in municipality *m* at time *t* are controlled for and denoted by *W* in the model. $Z_{m,t}$ is a vector of spatial characteristics for a given municipality $\boldsymbol{m}$ at a given year $\boldsymbol{t}$, which controls for the concentration of leisure services, unemployment rate and tax levels. The analysis is conducted using fixed-effect estimation to isolate place–specific characteristics that are not time variant. Most of the natural, historical and cultural amenities are intrinsic to the municipalities in question and are time invariant; their effects are absorbed by the fixed–effect error term u_m. *Dt* denotes the year dummies introduced in the model.

$$Q_{m,t} = \alpha + \beta ln\, AS_{M,t} + \gamma ln\, AS_{R,t} + \delta ln\, PD_{m,t} + \emptyset lnW_{m,t} + Z'_{m,t}\rho + Dt + u_m + \varepsilon_{m,t} \qquad (5)$$

Based on the theoretical discussions, one could also argue that the amenity effect should also be evident in the wage levels. However, the effect of amenities is much more capitalized in housing prices than in wage levels (Nilsson, 2013). Therefore, any change in the set of amenities in space should be reflected in housing prices more rapidly and more notably than in the wage levels.

One of the novelties of this paper is that the relationship between access to shops and place attractiveness is investigated separately for the *city* and *rural* municipalities of Sweden. A classification offered by the Swedish Board of Agriculture[20] is used to construct the urban and rural categories. In this classification, all 290 Swedish municipalities are initially grouped under four categories with respect to their population density: i) metropolitan municipalities (municipalities in the functional regions of Stockholm, Gothenburg and Malmö), ii) urban municipalities (regional centers outside of metropolitan areas and their 'suburb municipalities'), iii) rural municipalities (municipalities not part of (i) or (ii) with a population density greater than five people per km^2), and iv) sparsely populated rural municipalities (population density below 5 people per km^2). For this study, the metropolitan municipalities and urban municipalities in this study are grouped

[20] For further information, see http://jordbruketisiffror.wordpress.com/definitioner/landsbygder-och-stader/. A detailed description of such division can also be found in Westlund (2011) and Westlund et al. (2014).

together under the category called *CITY* municipalities, and the rural and sparsely populated rural municipalities are grouped under the category *RURAL* municipalities.

The *City* municipalities are expected to have a strong relationship with access to shops in close proximity because they attract not only local consumers but also consumers from the surrounding municipalities. The relative scale of the available consumption possibilities with respect to the size of these municipalities should be larger. It is expected that the consumption possibilities in the region are relevant to *Rural* municipalities rather than the consumption possibilities in the immediate market (municipality). Their scale may secure only a certain degree of a retail market, a major part of which then serves local consumers. A certain share of the residents in these municipalities is likely to be composed of commuters, who then benefit not only from what is available in close proximity but also from what is available in the region. Urban-periphery interaction suggests that the demand from consumers located in rural-peripheral markets is likely to inflow to central and larger markets but that the reverse is unlikely.

4. Examining the relationship between place attractiveness and access to shops

To elaborate further on the relationship between retail shops and place attractiveness, the appropriate estimation technique is to use a within estimator, which will track changes over time rather than accounting for level effects. Such estimation is particularly useful to eliminate the effect from the time-invariant characteristics of municipalities[21]. Examining place attractiveness through housing prices is challenging given that one must control for every place-specific asset to capture the actual effect of the variable of interest. The effects of, for example, a municipality having a coastal border, being in the center of the region, being in a metropolitan region, having a border with Norway, having one or more historical monuments, having a substantial amount of open space or having a certain type of climate on housing prices can then be captured using the municipality-specific time-invariant component of the composite error term *(as shown in the empirical strategy above).*

The maps presented previously for descriptive purposes flag the spatial dependencies among the municipalities that are hosted in the same region. The analysis uses local labor markets as regions that host multiple municipalities. A total of 81 local labor markets are defined based on the commuting intensity between municipalities. All of the 290 municipalities are grouped under these local labor markets, often referred as regions in this paper. The analysis is conducted at the municipal level using municipality-year fixed effects estimations. There is still a reason to argue that some of these variables, such as tax rate, and access to shops in the region may operate at the regional level even though the variables are calculated for individual municipalities. The possible effects of these spatial dependencies at the regional level are mitigated

[21] However, there may still be a set of variables that are time variant and omitted from the analysis, which raises concerns regarding endogeneity. The interpretation of the results avoids casual claims.

by local labor market clustered standard errors[22] (Moulton, 1990). The procedure through which the retail access variables are constructed also mitigates the spatial dependencies for the municipalities located in the same region (Andersson and Gråsjö, 2009).

Table 1 shows the results from the fixed-effects estimation[23]. A large portion of the R^2 values comes from the variable *Population Density*, as population inflow appears to be one of the main determinants of place attractiveness proxied by increasing Q ratios. The results obtained for *Access to shops in city, Access to shops in region, Population Density* and *Average Wage* are elasticities. Again, the *Access to shops in municipality* and *Access to shops in region* variables are orthogonalized against *Population Density*, and the linear relationship between the two is discriminated by running regressions and saving the residuals obtained from these regressions. In that sense, the access to shops measures can be considered to be 'size adjusted'. In other words, the result for these variables (access to stores in municipality and access to stores in region) indicates the relationship between consumption possibilities and place attractiveness for the respective municipalities beyond the effects resulting from their size.

Although the attributes of fixed-effect estimations mitigate unobserved variable bias in which time-invariant effects are eliminated, the analysis still avoids drawing causal claims by acknowledging that many relevant characteristics of these municipalities may still be time variant and omitted from the analysis (or otherwise indistinguishable from increases in retail). (See the appendix for descriptive statistics and pairwise correlations.)

[22] The effect of variables such as *Mean Wage* and *Tax* levels was previously significant at the one percent confidence level, but they are insignificant when standard errors are clustered across the local labor markets. These results imply that spatial dependence is largely relevant for the wage and tax levels of municipalities sharing the same local labor market, whereas no change in the significance of *Population Density* and *Retail Access* is observed.

[23] The coefficients in the regressions are statistically significantly different from each other.

Table 1: The relationship between store access and place attractiveness

	All Municipalities Q	City Municipalities Q	Rural Municipalities Q
Access to shops in municipality	0.0305*	0.0924**	0.0171
	[0.0177]	[0.0406]	[0.0181]
Access to shops in region	0.124**	0.355*	0.0780**
	[0.0532]	[0.205]	[0.0332]
Population density	2.679***	3.882***	2.225***
	[0.536]	[1.018]	[0.272]
Average wage	0.784***	0.513***	0.747***
	[0.0602]	[0.149]	[0.0623]
Leisure service concentration	0.281	0.463	0.239
	[0.200]	[0.428]	[0.267]
Municipal tax rate	−0.0358	−0.114	0.0132
	[0.0433]	[0.0772]	[0.0137]
Unemployment share	−0.0729	−0.669	0.432
	[0.990]	[2.331]	[0.533]
Year dummies	Yes	Yes	Yes
Municipality fixed effects	Yes	Yes	Yes
Observations	2,029	650	1,379
R–squared	0.486	0.502	0.519
Number of municipalities	290	93	197

Robust standard errors in parentheses ***p<0.01, ** p<0.05, * p<0.1
Standard errors are clustered at the level of local labor markets.
Coefficients are statistically significantly different from one another.

The first regression is run for all Swedish municipalities. Estimated coefficients in the first regression for the relationship between *Access to shops in municipality* and *Access to shops in region* and the Q ratios are consistent with the argument that consumption possibilities in a municipality and in the hosting region are positively related to place attractiveness beyond size effects. The relative importance of consumption possibilities in the region for place attractiveness appears to be much stronger than the importance of consumption possibilities in the municipality.

Interesting results are revealed when we examine the two separate regressions for *City* and *Rural* municipalities. In city municipalities, both access to shops in the municipality and access to shops in the region are positively related to place attractiveness. This relationship is notably stronger for the consumption possibilities in the region compared with those available in close proximity. By contrast, in rural municipalities, there appears to be no significant relationship between access to shops in the municipality and place attractiveness, although the results are consistent with the earlier argument that what is important for rural municipalities is the available consumption possibilities in the region rather than what is available within the municipal border. This signals that such municipalities may mitigate the lack of a large market by the consumption possibilities offered by their region.

The relationship between the Q ratios and the average wages in *city* municipalities is slightly weaker than it is for the *rural* municipalities, a finding that is also consistent with the earlier theoretical discussion. While rural markets depend on their local demand, city municipalities enjoy demand from further distances. Thus,

when the changes in other variables are held constant, any change in the wage level in rural municipalities appears to have a larger effect on place attractiveness as represented by the Q ratios. In both rural and city municipalities, all other control variables, leisure service concentration, municipal tax rate[24] and unemployment, reveal no significant relationship. Once again, a scale variable for leisure services is not introduced due to high correlation between access to shops. Thus, the leisure service concentration is a size adjusted measure, just signaling how specialized a municipality is in terms of available leisure services. The interpretation of the result, therefore, is not that the leisure services do not matter, but a possible change in the concentration of such services do not have a direct impact on the Q ratios.

5. Concluding remarks

Amenities, in broad terms, refer to place-specific assets that are known to contribute to a city's or region's attractiveness. Previous literature addresses the importance of such assets for regional growth and development in detail. This paper specifically investigates the importance of retailing to place attractiveness. The primary question addressed in the paper is whether the presence of retailers can be considered an amenity. Following a spatial equilibrium framework, an empirical investigation is conducted to capture the relationship between accessibility to stores in municipalities and in regions and place attractiveness as proxied by Tobin's Q ratios for housing investment in Swedish municipalities. The analysis not only accounts for the absolute number of stores but also considers these stores' accessibility. Using distance decay parameters in the calculation of retail accessibility, this analysis also considers the spatial continuum of the retail market. For both rural and city municipalities, the results signal a significant relationship between the place attractiveness of a municipality and the consumption possibilities in the labor market region where the municipality is located. The consumption possibilities available in close proximity are not found to be relevant to rural municipalities, whereas a positive relationship is observed between consumption possibilities in close proximity and place attractiveness for city municipalities. In addition to retail access, population density is found to explain a large share of the variation in the Q ratios. When the other attributes are held constant, any change in the wage levels appears to have a stronger effect on place attractiveness in rural municipalities than in city municipalities.

This paper contributes to the existing literature on retail geography and the importance of amenities for place attractiveness by investigating the relative importance of retail for place attractiveness when accounting for the size effect. The finding that a notable portion of the variation in place attractiveness across cities is explained by retail access suggests the multidimensional importance of the sector. This paper argues that the function of the retail sector extends beyond a simple supply and demand relationship. Many attributes of retail markets are planned and regulated by public authorities, which makes this line of analysis particularly relevant for decision makers, as the indirect effects of having a certain scale of retail market are highlighted.

[24] Somewhat significant and positive when the standard errors are not clustered across local labor markets.

References

Alonso, W. (1964) Location and land use. Toward a general theory of land rent. Cambridge, MA: Harvard University Press.

Adair, A., McGreal, S., Smyth, A., Cooper, J., & Ryley, T. (2000). House prices and accessibility: The testing of relationships within the Belfast urban area. Housing studies, 15(5), 699-716.

Andersson, Å. E. (1985). Creativity–the future of metropolitan regions. Stockholm: Prisma.

Anderson, S. T., & West, S. E. (2006). Open space, residential property values, and spatial context. Regional Science and Urban Economics, 36(6), 773-789.

Andersson, Å. E. and Andersson, D. E. (2006). The economics of experiences, the arts and entertainment. Cheltenham: Edward Elgar Publishing.

Andersson, M., Klaesson, J., & Larsson, J. P. (2014). The sources of the urban wage premium by worker skills: Spatial sorting or agglomeration economies?. Papers in Regional Science, 93(4), 727-747.

Andersson, D. E. (1997) Hedonic prices and center accessibility: conceptual foundations and an empirical hedonic study of the market for condominium housing in Singapore, Doctoral dissertation, Royal Institute of Technology, Stockholm.

Andersson, D. E., Shyr, O. F., & Fu, J. (2010). Does high-speed rail accessibility influence residential property prices? Hedonic estimates from southern Taiwan. Journal of Transport Geography, 18(1), 166-174.

Andersson, A. E., and Karlqvist, A. (1976). Population and Capital in Geographical Space. The Problem of General Equilibrium Allocation. in Computing Equilibria: How and Why, pp. 183-195, J. Los and W. Los (eds). North-Holland, Amsterdam, The Netherlands.

Andersson, M., & Gråsjö, U. (2009). Spatial dependence and the representation of space in empirical models. The annals of regional science, 43(1), 159-180.

Artle, R. (1959). Studies in the structure of the Stockholm economy, Business Research Institute at the Stockholm School of Economics, Stockholm.

Beckmann, M. J. (1958). City hierarchies and the distribution of city size. Economic Development and Cultural Change, 6(3), 243-248.

Berger, T. (2000). Tobins q på småhusmarknaden, in Prisbildning och värdering av fastigheter. (Ed.) T. Lindh, Institute for Housing and Urban Research, Gävle.

Berger, T., Englund, P., Hendershott, P. H., & Turner, B. (2000). The capitalization of interest subsidies: Evidence from Sweden. Journal of Money, Credit and Banking, 199-217.

Berg, L., & Berger, T. (2006). The Q theory and the Swedish housing market—an empirical test. The Journal of Real Estate Finance and Economics, 33(4), 329-344.

Brainard, W. C., & Tobin, J. (1968). Pitfalls in financial model building. The American Economic Review, 58(2), 99-122.

Brueckner, J. K., Thisse, J. F., & Zenou, Y. (1999). Why is central Paris rich and downtown Detroit poor?: An amenity-based theory. European economic review, 43(1), 91-107.

Cheshire, P., & Sheppard, S. (1995). On the price of land and the value of amenities. Economica, 247-267.

Cho, S. H., Poudyal, N. C., & Roberts, R. K. (2008). Spatial analysis of the amenity value of green open space. Ecological Economics, 66(2), 403-416.

Christaller, W. (1933). Die zentralen Orte in Süddeutschland, translated by Carlisle W. Baskin, 1966, as *Central Places in Southern Germany*. Englewood Cliffs, N.J.: Prentice-Hall.

Ciccone, A., & Hall, R. E. (1993). Productivity and the density of economic activity (No. w4313). National Bureau of Economic Research.

Clark, T. N., Lloyd, R., Wong, K. K., & Jain, P. (2002). Amenities drive urban growth. Journal of urban affairs, 24(5), 493-515.

Clark, T. N. (2003a). The City as an Entertainment Machine, Research in Urban Policy, Volume 9. Oxford: Elsevier.

Clark, T. N. (2004). Urban amenities: lakes, opera, and juice bars: do they drive development?. Clark, Terry Nichols (2004) The city as an entertainment machine. research and urban policy, 9, 103-140.

Combes, P. P., Duranton, G., Gobillon, L., Puga, D., & Roux, S. (2012). The productivity advantages of large cities: Distinguishing agglomeration from firm selection. Econometrica, 80(6), 2543-2594.

Des Rosiers, F., Thériault, M., & Villeneuve, P. Y. (2000). Sorting out access and neighbourhood factors in hedonic price modelling. Journal of Property Investment & Finance, 18(3), 291-315.

Dubin, R. A., & Sung, C. H. (1987). Spatial variation in the price of housing: rent gradients in non-monocentric cities. Urban Studies, 24(3), 193-204.

Elton, E. J., Gruber, M. J., Brown, S. J., & Goetzmann, W. N. (2009). Modern portfolio theory and investment analysis. New Jersey: John Wiley & Sons.

Florida, R. (2008). Who is your city? How the creative economy is making where to live the most important decision of your life. New York: Basic Books.

Glaeser, E. L. and Mare, D. C. (1994). Cities and skills. National Bureau of Economic Research, Working Paper No. 4728.

Glaeser, E. L., Kolko, J., & Saiz, A. (2001). Consumer city. Journal of economic geography, 1(1), 27-50.

Glaeser, E. L., Gyourko, J., and Saks, R. (2005). Why have housing prices gone up?. *National Bureau of Economic Research*, Working Paper No. 11129.

Glaeser, E. L. (2008). Cities, agglomeration, and spatial equilibrium. New York: Oxford University Press.

Gibbons, S., Mourato, S., & Resende, G. M. (2014). The amenity value of English nature: a hedonic price approach. Environmental and Resource Economics, 57(2), 175-196.

Geoghegan, J., Wainger, L. A., & Bockstael, N. E. (1997). Spatial landscape indices in a hedonic framework: an ecological economics analysis using GIS. Ecological economics, 23(3), 251-264.

Graves, P. E., & Linneman, P. D. (1979). Household migration: Theoretical and empirical results. Journal of urban economics, 6(3), 383-404.

Hacker, R. S., Karlsson, H. K., & Månsson, K. (2014). An investigation of the causal relations between exchange rates and interest rate differentials using wavelets. International Review of Economics & Finance, 29, 321-329.

Hart, C., Farrell, A. M., Stachow, G., Reed, G., & Cadogan, J. W. (2007). Enjoyment of the shopping experience: Impact on customers' repatronage intentions and gender influence. The Service Industries Journal, 27(5), 583-604.

Helsley, R. W., & Strange, W. C. (1990). Matching and agglomeration economies in a system of cities. Regional Science and Urban economics, 20(2), 189-212.

Isard, W. (1956). Location and space–economy. Cambridge, MA: MIT Press.

Irwin, E. G. (2002). The effects of open space on residential property values. Land economics, 78(4), 465-480.

Jaffee, D. M. (1994) Den svenska fastighetskrisen (The Swedish Real Estate Crisis). Stockholm: SNS Förlag.

Jacobs, J. (1961). The death and life of great American cities. New York: Random House.

Jin, B., & Sternquist, B. (2004). Shopping is truly a joy. The Service Industries Journal, 24(6), 1-18.

Johansson, B., Klaesson, J., & Olsson, M. (2002). Time distances and labor market integration. Papers in regional science, 81(3), 305-327.

Johansson, B., & Klaesson, J. (2011). Agglomeration dynamics of business services. The annals of regional science, 47(2), 373-391.

Jud, G. D., & Winkler, D. T. (2003). The Q theory of housing investment. The Journal of Real Estate Finance and Economics, 27(3), 379-392.

Klaesson, J., & Öner, Ö. (2014). Market Reach for Retail Services. The Review of Regional Studies, 44(2), 153.

Kim Karlsson, H. (2012). Dynamics of macroeconomic and financial variables in different time horizons. Doctoral dissertation No.77. Jönköping: Jönköping International Business School.

Krafft, M. and Mantrala, M. K. (2006). Retailing in the 21st century: current and future trends. Berlin: Springer.

Larsson, J. P. (2014). The neighborhood or the region? Reassessing the density–wage relationship using geocoded data. The Annals of Regional Science, 52(2), 367-384.

Larsson, J. P., & Öner, Ö. (2014). Location and co-location in retail: a probabilistic approach using geo-coded data for metropolitan retail markets. The Annals of Regional Science, 52(2), 385-408.

Lucas, R. E. (2001). Externalities and cities. Review of Economic Dynamics, 4(2), 245-274.

Lösch, A. (1940). Die räumliche Ordnung der Wirtschaft. Jena: G. Fischer. English translation (1954): The Economics of Location. New Heaven: Yale Univesity.

Lloyd, R. and Clark, T. N. (2001). The city as an entertainment machine. Critical Perspectives on Urban Redevelopment. 6(3), 357–78.

Marshall, A. (1890). Principles of Political Economy. New York: Maxmillan.

Mellander, C., Pettersson, L., & Öner, Ö. (2011). Culture city. Journal of Town and City Management, 2(3), 246-262.

Moulton, B. R. (1990). An illustration of a pitfall in estimating the effects of aggregate variables on micro units. The review of Economics and Statistics, 334-338.

Nilsson, P. (2013). Price Formation in Real Estate Markets. Doctoral dissertation No.088, Jönköping: Jönköping International Business School.

Oppewal, H., & Holyoake, B. (2004). Bundling and retail agglomeration effects on shopping behavior. Journal of Retailing and Consumer Services, 11(2), 61-74..

Öner, Ö. (2016). Retail Productivity: The effects of market size and regional hierarchy. Papers in Regional Science *(forthcoming)*.

Partridge, M. D., Rickman, D. S., Ali, K., & Olfert, M. R. (2008). The geographic diversity of US nonmetropolitan growth dynamics: a geographically weighted regression approach. Land economics, 84(2), 241-266.

Puga, D. (2010). The magnitude and causes of agglomeration economies. Journal of Regional Science, 50(1), 203-219.

Rivera-Batiz, F. L. (1988). Increasing returns, monopolistic competition, and agglomeration economies in consumption and production. Regional Science and Urban Economics, 18(1), 125-153.

Rosen, S. (1979). Wage-Based Indexes of Urban Quality of Life. in Current issues in urban economics. Eds.: Mieszkowski, P. & Straszheim, M. pp. 74-104. Baltimore, MD: Johns Hopkins University Press for Resources for the Future.

Roback, J. (1980). The Value of Local Urban Amenities: Theory and Measurement. Doctoral dissertation, Rochester, NY: University Rochester.

Roback, J. (1982). Wages, rents, and the quality of life. The Journal of Political Economy, 1257-1278.

Söderberg, B., & Janssen, C. (2001). Estimating distance gradients for apartment properties. Urban Studies, 38(1), 61-79.

Takala, K. and Tuomala, M. (1990). Housing investment in Finland. Finnish Economic Papers, 3, 41–53.

Teller, C., & Reutterer, T. (2008). The evolving concept of retail attractiveness: what makes retail agglomerations attractive when customers shop at them?. Journal of Retailing and Consumer Services, 15(3), 127-143.

Tiebout, C. M. (1956). A pure theory of local expenditures, Journal of Political Economy, 64, 416–424.

Tobin, J. (1969). A general equilibrium approach to monetary theory. Journal of money, credit and banking, 1(1), 15-29.

Tyrväinen, L., & Miettinen, A. (2000). Property prices and urban forest amenities. Journal of environmental economics and management, 39(2), 205-223.

Ullman, E. L. (1954). Amenities as a factor in regional growth. Geographical Review, 44(1), 119-132.

Von Thünen, J. H. (1826) Der isolierte Staat. *The isolated state*. English translation. Heinrich, J. Oxford: Pergamon, 1966.

Weber, A. (1909) Über den Standort der Industrien, Tubingen : JCB Mohr. English Translation. (1929) Alfred Weber's Theory of Location of Industries. Friedrich, C. J. Chicago: University of Chicago Press.

Westlund, H. (2011). Multidimensional entrepreneurship: theoretical considerations and Swedish empirics. Regional science policy & practice, 3(3), 199-218.

Westlund, H., Larsson, J. P., & Olsson, A. R. (2014). Start-ups and local entrepreneurial social capital in the municipalities of Sweden. Regional studies, 48(6), 974-994.

Wrigley, N., & Lambiri, D. (2014). High street performance and evolution: A brief guide to the evidence. Southampton: University of Southampton.

Appendix 1: Descriptive statistics

Variable	Obs	Mean	Std Dev	Min	Max
ALL					
Q	2030	0.801	0.459	0.170	3.370
Access to shops in municipality	2030	0.000	0.865	−2.303	2.346
Access to shops in region	2030	0.000	1.219	−5.165	2.930
Ln_Population density	2030	3.331	1.623	−1.427	8.368
Ln_Mean wage	2030	11.370	0.309	10.409	12.935
Leisure concentration	2030	0.055	0.016	0.000	0.106
Municipal tax	2029	21.408	1.299	17.120	33.250
Unemployment share	2029	0.020	0.007	0.005	0.054
CITY municipalities					
Q	650	1.186	0.475	0.380	3.370
Access to shops in municipality	650	0.117	1.143	−2.303	2.346
Access to shops in region	650	0.076	1.238	−5.165	1.983
Ln_Population density	650	4.864	1.291	2.348	8.368
Ln_Mean wage	650	11.378	0.440	10.409	12.935
Leisure concentration	650	0.056	0.017	0.000	0.106
Municipal tax	650	20.697	1.278	17.120	22.800
Unemployment share	650	0.020	0.007	0.005	0.041
RURAL municipalities					
Q	1379	0.619	0.316	0.170	2.530
Access to shops in municipality	1379	−0.055	0.690	−2.061	1.647
Access to shops in region	1379	−0.036	1.209	−4.020	2.930
Ln_Population density	1379	2.607	1.207	−1.427	5.124
Ln_Mean wage	1379	11.366	0.223	10.833	12.170
Leisure concentration	1379	0.054	0.016	0.000	0.100
Municipal tax	1379	21.744	1.167	18.760	33.250
Unemployment share	1379	0.021	0.007	0.005	0.054

Appendix 2: Pairwise Correlations

	Q	AS_mun	AS_reg	(Ln)PopDensity	(Ln)MeanWage	Leisure con	Municipal tax	Unemp share
ALL								
Q	1							
AS in mun	0.1159	1						
AS in reg	−0.0513	−0.5030	1					
Ln_PopDensity	0.7494	0.0002	−0.0002	1				
Ln_MeanWage	0.1542	0.4948	−0.3838	0.1911	1			
Leisure con	0.1069	0.3778	−0.3207	0.0534	0.3112	1		
Municipal tax	−0.5083	0.1047	−0.1679	−0.5987	−0.0298	0.0803	1	
Unemp share	−0.2768	0.3544	−0.3803	−0.1983	0.0754	0.2195	0.2734	1
CITY								
Q	1							
AS in mun	−0.0237	1						
AS in reg	−0.1458	−0.6540	1					
(Ln)PopDensity	0.7325	−0.0209	−0.1901	1				
(Ln)MeanWage	0.2435	0.6343	−0.5500	0.3190	1			
Leisure con	0.0678	0.4577	−0.4155	0.0244	0.4110	1		
Municipal tax	−0.6380	0.1988	−0.0578	−0.6743	−0.0320	0.1784	1	
Unemp share	−0.3606	0.5349	−0.4535	−0.1263	0.3665	0.3111	0.3643	1
RURAL								
Q	1							
AS in mun	0.1925	1						
AS in reg	−0.0567	−0.4208	1					
(Ln)PopDensity	0.5206	−0.1336	0.0433	1				
(Ln)MeanWage	0.0822	0.2862	−0.2692	0.1722	1			
Leisure con	0.1203	0.3242	−0.2765	0.0304	0.2418	1		
Municipal tax	−0.1967	0.1179	−0.2207	−0.4084	−0.0181	0.0676	1	
Unemp share	−0.2769	0.2294	−0.3409	−0.2776	−0.2065	0.1743	0.2300	1