Regional and Urban Economics

Dental industry

Sindre Halvorsen Øveraas , Sebastian Mena Fløysand, Alen Colakovic & Mona Lisa Jones

Abstract

`The topic of research (What was studied)`

`The purpose (What was done)`

`The methodology (how the research was done)`

`Main findings (what was found)`

`Policy and implications (significance of findings)`

Introduction

Our main task in this assignment is to perform an analysis of geospatial determinants of firm activity. More specifically we are to focus on the Norwegian dental industry in this regard, and see how geospatial determinants such as distances to shopping malls and CBDs (Central Business Districts), as well as population density can determine dental businesses income and general financial operations. As an example, central questions in this assignment will be; "Is it more beneficial to be highly centralized in urban areas with high population density and many competitors, or is it a greater advantage to be less centralized to the advantage that the nearest competing company is considerably further away?", "Which determinants appear to be most significant for economic benefit?"

`A brief description of the problem and its importance`

`Statement of purpose or what was done`

`A brief description of main results`

`Description of methodology, main challenges and solutions`

`Discretion of the papers contribution in relation to previous research`

`Organization of paper`

Hypothesis

The location choice of firms providing service to end consumers, significantly determine their ultimate growth potential.

Research question

What is the most profitable location for dental practice?

Theoretical Framework

Location theory gives regional economics its scientific disciplinary identity and constitutes its theoretical methodological core (**capello2011?**). It has typically microeconomic foundation and uses theoretical models as well as adopting a statistical and geographical approach (**capello2011?**). Furthermore, the theory uses the concept of externalities in the spatial distribution of activities, thereby laying the territorial bases for dynamic approach to economic growth (**capello2011?**).

Regional growth theory involves spatial aspects of economic growth and territorial distribution of income (**capello2011?**). It also involves generating geographical advantages, in terms of easy or difficult access to a particular area (**capello2011?**).

Furthermore, Keynesian economics emphasizes the importance of consumer demand in driving economic growth. This may involve policies that involve consumer spending, such as incentives for buying local products or supporting small businesses or in this case preventing the the death of down town due to competition from shopping malls. Subsequently, increasing consumer demand, supporting business in a specific region. Promoting economic growth or preventing economic decline (**capello2016?**).

Harald Hotelling's locational equilibrium is determined by a logic of profit maximization whereby each producer controls its own market area. Productivity advantages of cities and urban clusters with a high density of firms increase profit by attracting a larger number of potential customers, and more productive workers (**capello2011?**). Furthermore, the attractiveness of a central location increase the cost of rent.

Alonso's bid rent model indicates the most profitable location for firms. Closer to the centre with agglomeration attributes or in rural areas with spacial monopoly and low rent. In gravitational models, the attractiveness of the retail location, represent the size of the retail centre. Furthermore, it depends on the variety of goods which can be purchased at the same location (**mccann2013?**).

The model of potential has the capacity to measure the potential of attractiveness to a place. Bigger cities or more heavily populated areas have a stronger gravitational force. A possible indicator to predict places of growth potential for dentist practice or shopping malls (**capello2015?**).

Interdependent location choice, the Hotelling's model (1929)

The model assume that given the location of producers, and given demand uniformly distributed geographically (in linear or circular form) the market is divided into areas within each of which there operates a single firm in a duopoly environment. Furthermore, no relocation costs and demand only depend on location choice (**capello2015?**). The location game starts off with the total market of AB, firm A in the middle of location A and firm B starts in the middle of location B. One firm starts relocating closer to the other to take some of the customers in the other market area (**capello2015?**). The other respond by doing the same and the game continues until both end up in the middle of the market on the broader of AB. The end of the game is the position where neither can increase sales volume by moving position (**capello2015?**).

A simple explanation of why two dentists providing the same service, at the same price might locate next to each other. Nevertheless, despite increasing the transportation cost for patients. Perhaps the simplest way to explain why there is a natural tendency for retailers to cluster in space; a tendency which may help explain the existence of larger agglomeration economies.

Hotelling-Bertand model (1979)

The Bertrand model was introduced as early as in 1883 and demonstrate two firms competing by simultaneously setting prices for their homogeneous products. Furthermore, the consumers choose the product with the lowest price@tolotti2020. The model assumes that firms have identical production cost and consumers have perfect information about prices (**tolotti2020?**).

By combining elements from the two models a hybrid model of spatial completion was birthed by Salop in 1979 (**tolotti2020?**). In this model firms compete both in location and price, with consumers having a transportation cost and firms producing differentiated products (**tolotti2020?**).

Marshall's agglomeration principles

Marshall (1920) broadly divides externalities within agglomeration in three main categories potentially drive sales. Firstly, knowledge spill-over within industries or product specific technological knowledge. Furthermore, market transactions in terms of value chain transactions with industry-specialized buyers and suppliers. Lastly, competition for specialized production factors such as labour and product market competition (**nielsen2021?**).

There are solidly established conclusions regarding the existence of agglomeration economies (**puga2010?**). However, less proof of their estimated magnitude. Hence, identifying the causes of agglomeration economies, is proving more difficult (**puga2010?**). Nevertheless, there is a large theoretical literature that develops these mechanisms (**puga2010?**). (**duranton2004?**) discuss these classifications and identify *learning, sharing* and *matching* as the main causes of agglomeration economies.

A larger market allows for a more efficient sharing of local infrastructure and facilities. Therefore, a variety of intermediate input suppliers, or a pool of workers with similar skills (**puga2010?**). Despite higher rent the dental industry and shopping malls, seams to reap higher benefits in more populated areas as they are dependent on being located where there is a higher volume of patients in order to drive sales. The attraction for the consumers and users of public facilities is overall cost reduction (**puga2010?**). Hence, the larger the population sharing facilities the lower the cost per user (**puga2010?**). Presumably, industrial factories and business clusters are more dependent on being close to raw materials and industrial action.

Furthermore, a larger market also allows for a better matching between employers and employees, improved chances of finding suitable and better quality of matches (**puga2010?**). Shopping malls require skilled workers to drive sales. However, they are not so dependent on highly educated workers as dentists whom according to resent study, tend to prefer bigger cities (as they are highly educated) (**davis2020?**). More-so, cites provide a constant market for specialized skills and more productive work force (**puga2010P?**) Perhaps, a possibility for higher wages being compensated by more efficient workers in bigger agglomeration economies. That said the Norwegian cities might differ from the american cites in the study, as the population and clusters are no where near the same size. Lastly, a larger market can also facilitate learning by promoting the development and widespread adaptation of new technologies and business practice (**puga2010?**).

Interactions with experienced workers helps acquire valuable skills. Experienced workers remain in cities to share the rent of this learning process (**puga2010?**). Besides this purposeful transition of knowledge, the information literature on learning in cities has also emphasized the unintended casual flow of information facilitated by big cities." (**puga2010?**)

Urban location of dentist; The Alonso model

The Alsonso model demonstrate geographical locations tied up to location. Furthermore, It is an urbanized formulation of the nineteenth century von Thünen model (**capello2015?**). In this case used to get an indicating of where the most profitable location for dental practise.

Alonso assumes the existence of a city that cannot be build instantaneously, and therefore of an effective rent-curve from the city centre to the periphery. Furthermore, it determines the location for a new firm willing to locate in the city and the profit the firm can obtain. In some cases different from the normal or average price competition (**capello2015?**).

As the Von Thünen assume a uniformed space where all land is equally fertile, this model envisages a city, endowed with infrastructure which cover the entire city in all directions whereas unit transport costs are constant