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Background

The main motivation for developing this accessibility instrument was the need for a new retail policy in Belgium (Flanders). In the past, Belgium used economic restrictions in its retail policy. The European Directive on services in the internal market (Directive 2006/123/EC of the European Parliament and of the Council (European Union, 2006); commonly referred to as the Bolkestein Directive) states that as of 2009 such restrictions are no longer allowed. It is however still possible to use restrictions in retail policy, mainly arguments of spatial planning are tolerated. Such a policy requires intricate insights in the retail landscape. However, current decision taking is limited to a case by case approach based on expert knowledge since the necessary coordination and tools are not available. We therefore designed this tool to analyse the retail landscape of Flanders and as a possible aid for developing a new restrictive retail policy based on spatial planning.

The scientific research questions are how retail spreads along the landscape and why, in other words what are the parameters which determine the location of retail companies. Furthermore the potential influence of policy on retail sprawl is under scrutiny. In the first place we want to test to what extent the parameters of the classic spatial interaction models are still valuable. In this reasoning accessibility to both supply and demand is crucial.

The main planning problem we want to address is the following: there are sound socioeconomic reasons to limit retail sprawl, such as protecting open space (Flemish Government, 2011), sustainability (see for example Newman et al (1995), Banister (1999, 2007 & 2008), Burton (2000), Kennedy et al (2005), Kenworthy (2007) and Glaeser & Kahn (2010) on the sustainability of compact cities), mobility issues (Boussauw et al, 2011), the rise of the knowledge economy and the associated rise in importance of the vibrancy of cities (van den Berg, 1999; van den Berg & Braun, 1999; van den Berg et al, 2004; van Winden et al, 2007; Whisler et al, 2008; Yigitcanlar et al, 2008) and the social role of retail (Harvey, 1973) (particularly food retail, cf. food deserts (see for example Clarke et al (2002), Guy et al (2005) and Zenk et al (2005))). Governments all across Europe want to spatially restrict the sprawl of retail firms (Davies, 1995; Guy, 1998; Péron, 2001). In this regard policy in many European countries has failed (Davies, 1995; Guy, 1998; Péron, 2001). Contrarily, a spatial restrictive policy might lead to a drop in productivity and consumer welfare (Evers, 2001; Griffith & Harmgart, 2008; Haskel & Sadun, 2009; Cheshire et al, 2011; Matsumura & Matsushima, 2011). The tool can aid in developing a spatially restrictive policy that takes both retail sector productivity and welfare into account.

Conceptual framework and theoretical underpinnings

The retail landscape is the outcome of the location decision of retail companies. This decision process is mainly determined by the accessibility of the available locations (already defined by Christaller (1933)). The government influences accessibility and location decisions via a wide array of policies, ranging from transport and land-use planning to fiscal and social measures. Accessibility can here be defined as the ease of reaching a shop by potential consumers. In general customers prefer a varied supply of shops. As a consequence it is an advantage in the retail sector to locate close to competitors and other retailers (Arentze et al, 2005). Hence, our tool primarily focuses on the delimitation of retail clusters. The location, size and composition of clusters are correlated to the accessibility of the site. Gravity based accessibility measures and infrastructure based accessibility measures seem to be appropriate estimators of the retail landscape since they incorporate population (demand), infrastructure and distance characteristics.

Operational aspects

Given the fact that we have geo-referenced data of shops at our disposal, we can employ a multitude of accessibility measures, including gravity type potential accessibility measures and infrastructure based accessibility measures. In practice we are able to measure the distance of retail clusters to relevant infrastructure, such as the nearest train station and major roads.

The data input from the tool comes from the Locatus database (Locatus, 2012). Locatus data are available for Belgium, Luxemburg, the Netherlands and a selection of major European cities. The databases include information on coordinates and addresses of individual shops, detailed information on the type of retail, the type of road a store borders, the net floor surface of shops (limited) and the type of shopping area. The database for Flanders, Belgium was provided free of charge to the Department of Transport and Regional Economics of the University of Antwerp as support for research for the Flemish Government. Ideally one would use this or similar data as input for the tool. An analysis can already be made using basic geographical information on the location of stores. To fully explore the possibilities of the tool, one would ideally have information on the type of retail and the size of shops or length of the store front.

The tool has been developed using Model Builder in the ArcGIS 10 suit, developed and distributed by ESRI. The first part of the tool (to calculate clusters) requires no further extensions. The second part (to calculate distances) requires the Spatial Analyst extension. Currently the tool works with Euclidean distances. It is possible to upgrade the tool to include real distances. The Network Analyst extension is then required. The tool works best in ArcGIS 10, but has been tried and tested in ArcGIS 9.3 to satisfactory results. To calculate clusters for a set of 34000 records a mid range laptop (PC specs: dual core 1.3 GHz, 4Mb RAM) requires about 1 to 1.5 hours. ArcGIS is not publicly available, and comes at a significant cost, but is widely used.

Both performing the calculations and interpreting the results of the calculation is relatively easy. The tool is very intuitive and user friendly and can therefore be used by anyone with a basic understanding of GIS software. This means that the tool can also be used with limited support by non-professionals in small cities and companies enlarging the chance of a better application of policy on an operational level. More experienced users will find it easy to tweak the tool to fit their specific needs, to adjust the tool to different data, to solve related problems or create interactions with other tools.

It is important to note that in our database no data is grouped into a higher level, i.e. no data is grouped at the statistical ward or municipal level. If this is the case some further statistical methods have to be included, as was discussed by Sadahiro (2003).

Relevance for planning practice

The tool has not yet been introduced in practice, but it has been developed and tested within policy research for the Flemish Government to analyse the retail landscape of Flanders and possibly as an aid and input for a new retail policy. Also lower tiers of governance, such as provinces and municipalities, have shown interest in applying the tool and a few are testing it. We have a great deal of confidence that the tool will eventually be used in practice.

As was said Belgium needs to change its retail policy because of the Bolkestein Directive which aims to liberalise the European services market. We have noticed from an extensive literature review that from a planning point of view spatial restrictions are a good tool and are to be preferred over economic restrictions (see also Davies (1995), Guy (1998) and Péron (2001)). However some cases described in the available literature, in casu the Dutch case, show that a retail policy based on strict spatial planning can lead to losses in sector productivity and possibly a drop in consumer welfare (Evers, 2001). Since Belgium has more urban sprawl than the Netherlands and Germany, a policy based on strict spatial planning in the Dutch or German style may lead to even more detrimental results. The tool is able to show which areas are interesting for retailers to invest in, areas where they can fulfil their economic needs, by linking clusters to socioeconomic location factors. Such locations can then be associated to areas which the government itself wants to develop. Thus the needs of society and the economic requirements of private companies can be matched.

Strengths and limitations

Academic research in retail planning policy has significantly slowed down the last decade. Most of the available literature is thus rather dated. The actual tool will allow further investigation of the location of retail and the influence of planning on the location of retail in the 21st century. A weakness of the tool is that it now only allows for a cartographic analysis. In future updates of the tool more spatial econometric outputs will be calculated.

The most important practical benefit of the presented tool is the ease of use of the instrument and the straightforward interpretability of the results. This means on the one hand that the tool can also be used at the municipal level where the planning policy in Belgium is actually operationalized. On the other hand the instrument is not a black box and allows experienced users to tweak its functionality, which significantly increases the usability of the tool and permits interactions with other instruments. An important hindrance in bringing the tool into practice is the data requirements. As was already explained, the tool uses expensive databases. These databases need to be updated regularly which leads to high fixed costs. Many cities in Europe however have an increasing interest in retail developments as they start recognizing the influence of retail on liveability, both in an economic and social way. As such they are starting to provide data on the matter.

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