THE ROLE OF DIFFERENT URBAN AMENITIES IN ATTRACTING KNOWLEDGE WORKERS

PRESENTING THE RESEARCH DESIGN AND FIRST RESULTS

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Abstract

Human capital is a fundamental factor for every major urban agglomeration in modern-day society and economy. Urban amenities facilitate face to face contact both for pleasure and for productivity. Hence, the aim of this paper is to investigate the relationship between these amenities and the presence of highly-educated knowledge workers on a neighbourhood level: do amenities such as shops respond, through time, to the presence of knowledge workers or lack thereof, and to what extent? Or do amenities such as theatres attract knowledge workers? Identifying relationships between amenities and knowledge workers can offer local policy makers better tools for planning strategies to attract more highly-educated people with high incomes to the urban area.

We aim to present an analysis on a highly-detailed spatial scale-level (e.g. four-digit zip code or neighbourhood areas) by linking lifestyle-data on level of education, income, et cetera about inhabitants (with a special focus on highly-educated knowledge workers) to detailed data about different types of urban and cultural amenities in the vicinity. We plan to first do a cross-section analysis to explore the relationships. To address causality issues, we will subsequently expand our analysis by including a time-dimension in our model. Both data sets are available on a detailed spatial scale and for a series of years.

INTRODUCTION

Apart from housing quality and employment accessibility, knowledge workers are relatively strongly attracted by urban amenities such as the presence of shops, a variety of restaurants, recreational public spaces (e.g., parks), and by cultural facilities such as theatres, museums and cinemas. Since the knowledge-intensive and often specialised jobs these people qualify for are only available in a small number of larger metropolitan areas, they also tend to be more mobile (both within and across countries) than others and this makes it even more important to keep/make the urban area attractive for them.

Sleutjes (2013) carried out a literature study on factors that attract knowledge workers to cities ('acquisition)' or retain them in cities ('retention'). Important acquisition factors are access to jobs and the ability of having an active, large social network. Important retention factors are the level of urban facilities, among which are cultural facilities. Urban facilities are, for example, the presence of shops, a variety of restaurants and recreational public spaces (e.g., parks). Theatres, museums and cinemas are cultural facilities. Other interesting aspect about location preferences of knowledge workers mentioned by Sleutjes (2013) are that in terms of having a preference for either urban or suburban housing, large differences exist between various demographic and lifestyle groups. In particular younger and single people typically prefer the city, with urban facilities nearby. The more mature and settled knowledge workers with a family have a more heterogeneous location preference, including a preference for suburban locations. Further, Rouwendal (2013) emphasizes that the higher-educated attach a relatively high value to the proximity of cultural heritage in the urban environment ('protected cityscapes').

From an international perspective, Lucassen and Willems (2009) also mention the increased marketability of culture and the growing fame of Dutch design. As culture is becoming more and more important for national and urban economies, it presumably plays an increasingly important role in attracting international knowledge migrants to Dutch cities as well.

So, highly skilled workers are presumably attracted to neighbourhoods with such amenities. On the other hand, such amenities can only exist when they have enough visitors and associated revenues. Causality thus runs in two directions and it is not easy to figure out what exactly is the impact of better amenities on the attractiveness of a neighbourhood to highly skilled workers.

It is obvious that the absence of correlation between amenities and the presence of highly skilled workers is a strong indicator that neither of the two plausible causal relationships is present. It is therefore worthwhile, as a first check, to investigate this causality. This can be done using cross-section data.

If we have panel data, there are more possibilities. It seems natural to assume that the relationships we are interested in operate with a time lag. If the number of amenities in a neighbourhood increases in year t, it may take some time before the share of highly skilled

workers goes up. Conversely, if the number of highly skilled workers goes up, it will take some time before the number of shops goes up as well. The idea is now to study the variation over time in both variables to investigate the causal relationships.

METHODOLOGY

In a first step, we use data aggregated on four-digit zip code level (PC4) to investigate trends in income, education level and level of urban and cultural facilities for the period 2001-2007. The data for this analysis is obtained from Bisnode Netherlands and from the ABF Real Estate Monitor (2007). The idea is to compare developments between household composition, income and education on the one hand versus facilities on the other hand in order to see if both sets of variables follow a similar pattern and which one follows the other in time. It is our expectation that the level of urban & cultural facilities in an area will correlate with the average income and education level.

Subsequently, we will do a one-year cross-section analysis of house transaction data to establish the value of urban and cultural facilities. The house transaction data has been made available by the Dutch Association of Real Estate Brokers (NVM). Essentially, house prices can be broken down into various types of house characteristics: structural and location characteristics. Using the Hedonic Pricing Method, a revealed preference method (Rosen, 1974), as monetary value can be attached to each characteristic. This way, the value of the amenities can be unravelled. See Lazrak et al. (2012) for a more extensive discussion of this method and its application to the valuation of cultural heritage.

Since different types of people (with, e.g., different income and education levels), may well attribute a different values to these types of amenities, ideally one would like to estimate different parameter values for different types of people. That would allow us to zoom in on the higher-educated classes. A finite mixture regression model is specifically designed to do just this: different types of people are grouped in different, more or less homogenous clusters and for each cluster separate coefficient estimates are computed. This approach is data-driven, prevents overparametrization and thus reduces heterogeneity issues and removes the often-disputed filtering of the data on outliers before the analysis as outliers are automatically grouped in a separate cluster. See Jedidi et al. (1996; 1998) and Helsen et al. (1993) for a more extensive discussion of the methodology.

A disadvantage of the aforementioned cross-section analyses is that they can show a relationship between level of facilities and house prices, but they do not say anything about causality. We need to do a panel data analysis to get an idea of causality. Therefore, in a third step, we carry out a panel data analysis.

It would be ideal if we knew about some exogenous change in either the number of amenities or the share of highly-skilled workers in a neighbourhood. For instance: due to the construction of high quality housing, new households with high incomes are attracted to a neighbourhood with predominantly social rental housing. Does the number of shops et cetera increase in the following years? Or: office buildings in a neighbourhood are renovated. One of the proposals is to make the area livelier. Therefore shops are created on the ground floor level of some of these buildings. Although most visitors are people employed in the buildings, the shops also attract people from a neighbouring residential area. Does the arrival of the high quality shops result in an increase in the share of skilled workers in this residential area? Case studies like these are generally believed to be able to provide the most convincing evidence of the causal relationships involved.

There is also a general methodology, called vector autoregressive (VAR) models, that allows one to study these processes without having to concentrate on 'natural experiments' of the type just discussed. Estimated models can be used to derive 'impulse response functions' which show the impact of a 'shock' (=exogenous change) in one variable on the development over time of the other.

DATA

The various models we will estimate need quite some data input on a detailed spatial level and for a range of years. This section presents a list of the most important variables used (see Table 1). The selected variables are based on the aforementioned literature sources. In the table we indicate in what analyses we plan to use which variables. Some variables are correlated, for instance income data, level of education and information on social class. We plan to test multiple combinations of variables to see what combination performs best and present the first estimation results at the ERSA conference in Palermo.

Table 1. Summary statistics for some of the variables included in the case study (period for all variables: 2002-2007, unless stated otherwise)

Variable	Spatial level-of-detail	Source data set	Used in what analysis: Corre-lation	Cross-section	Panel analysis
Level of urban facilities					
Urban attractivity[1] (2002)	500m grid	LISA, Geomarktprofiel	X	X	
Number of theatres, museums, cinemas	PC4	ABF	X	X	X
Number of hotels, restaurants and bars	Municipality[2]	ABF	X	X	X
Retail density (2002)	500m grid	LISA, Geomarktprofiel	X	X	
Number of houses from before 1900	500m grid	LISA, Geomarktprofiel	X	X	
Inhabitants					
Share of highly-skilled workers	PC4	Bisnode	X	X	X
Income data	PC4	Bisnode	X	X	X
Social class (types A, B1, B2, C and D)	PC4	Bisnode	X	X	X
Transaction characteristics of house transactions					
Price	Address	NVM		X (dep.)	
Free of transfer tax	Address	NVM		X	
Leased Land	Address	NVM		X	
Structural characteristics of house transactions					
Building age (7 classes)	Address	NVM		X	
Surface area	Address	NVM		X	
Number of rooms	Address	NVM		X	
Presence of Garage (0/1), Carport (0/1), Garden (0/1)	Address	NVM		X	
House type (15 types)	Address	NVM		X	
Inside maintenance					
Spatial characteristics of house transactions					
Accessibility: Proximity to train stations, Proximity to highway ramp	Meters	SPINlab		X	
Distance to public open space, e.g. nearest public access park	Meters	CBS soil statistics	X	X	
Distance to 100,000 jobs	500m grid	PBL		X	
Population density				X	
Amount of 'protected cityscapes' (km^2)		Van Duijn and Rouwendal (2013)	X	X	
Amount of 'protected cityscapes' (km^2) in surrounding municipalities		Van Duijn and Rouwendal (2013)	X		

[1] This variable comes from the Netherlands Environmental Assessment Agency (PBL) and is a composite index variable on a 500m grid level with information on number of cultural facilities, number of retail outlets, number of hotels, restaurants and cafes and number of houses from before 1900. It is tested in two ways: using the four underlying datasets following Dekkers (2010) and using only three datasets (excluding the number of houses from before 1900) following Van der Straaten (2010).

[2] Unfortunately this variable was not available on a more detailed spatial level.

EXPECTED RESULTS AND DISCUSSION

From the correlation and cross-section analyses, we expect to find a positive correlation between the presence of (young) higher-income households and the level of urban and cultural facilities. From the panel data analysis using the VAR-model, we hope to find evidence that, for instance, investing in housing quality attracts households with higher incomes which on its turn attracts urban facilities, or that investing in an upgrade of the level of urban facilities causes an 'image upgrade' for a neighbourhood which in turn might cause a rise in house prices as was the case in the brownfield redevelopment project of the Amsterdam Western Gas factory (see Van Duijn, 2013). The rising house prices, in time, then potentially lead to a shift in population towards the upper income (and education) segments. It might well be that both cases turn out to be possible.

An interesting extension of the analysis would be to combine the house transaction data with information about the buyers. Buyer information, including information about income and education level, can be obtained by linking the house transactions with the Social Statistical Data set (SSB) from Statistics Netherlands. This way we can directly link the cluster we are interested in, the higher educated, with house transactions and examine their willingness-to-pay for urban amenities.

Another useful extension of the analysis lies in the addition of information about job sectors. According to Sleutjes (2013), preferences also differ between job sectors: employees from the creative industry are more dependent on (social) networks and therefore tend to cluster. They also value image and atmosphere of an area higher because it impacts their companies' image. They therefore prefer neighbourhoods around to or in the inner city. Lucassen and Willems (2009) also mention the importance of a social network and the clustering of cultural/creative industries. In contrast, location preferences of employees with a beta/IT type of job do not diverge that much from the preferences of knowledge workers in general. Classical location factors such as available space and accessibility are equally as important for this group.

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