

Urban Regions in the Delta (URD) – Location Preferences of Knowledge Workers

Description of the project

a) Rationale and background

Urban regions are crucial for the economy. High density facilitates the interaction between economic actors. The enormous decrease of transportation costs and the rise of ICT did not make cities superfluous and it has become clear in recent years that e-mail, mobile phones et cetera should more properly be regarded as a complement to, than as a substitute for face-to-face contacts. Pecuniary externalities were famously stressed in Krugman's core-periphery model (Krugman, 1991), but a complete picture of the functioning of cities will certainly give a large role to formal as well as informal personal contacts between workers. In a globalising economy the strength of Europe lies in its human capital. Highly educated workers play a key role in keeping the European economies competitive in a rapidly changing world (Ter Weel et al., 2010). Since the knowledge-intensive and often highly specialised jobs they qualify for are only available in a small number of larger cities, they also tend to be more mobile than others and this makes it important to keep our cities attractive for them.

To make optimal use of the human resources that are available the quality of urban areas as places to work, live, and recreate is of crucial importance. For present-day workers the job is of primal importance, as it was for their ancestors, but they also have clear preferences with respect to other aspects of life. These concern not only the quality of the house and the accessibility of employment from its location, but also the characteristics of the neighbourhood like safety and the identity of the place, the presence of shops and recreational facilities. Highly educated workers have relatively strong preferences for urban amenities like a diversified supply of restaurants, theatres and concert halls. Recent research by the Netherlands Bureau for Economic Policy (de Groot et al., 2010) has shown that the market area of these amenities is typically much smaller than spatial labour market areas. This observation explains the much higher level of house prices in neighbourhoods with good accessibility to concentrations of consumer amenities. The price differences indicate the importance attached to them. But the high house prices also signal scarcity and cause workers to look for other places to live. Although the supply of land is limited in any urban area, there are many different ways in which it can be used. Real estate is an extremely durable commodity and decisions taken now can have consequences for decades. Bad choices can cause long lasting trouble. The strong relationship between skills and flourishing cities makes it important that urban land use policies (*'gebiedsontwikkeling'*) keeps a clear eye on the consequences of measures taken now for the present and future inhabitants of the city.

Urban amenities are also important for facilitating the face-to-face contacts that are so important for modern societies. Interactions between skilled and creative people appear to be crucial for continued economic growth in a dynamic setting where today's production techniques can be outdated tomorrow (Storper & Venables, 2004) and cities regularly have to 'reinvent' themselves to continue their existence (Bontje et al, 2011). Facilitating this process is therefore important for flexibility in finding answers to the challenges of the future. There is consensus that human capital is the main asset of the European cities and keeping our cities attractive for this increasingly mobile group of people is therefore of crucial importance.

b) Research plan (approach & methods)

The main issue to be addressed in this research is: How can we keep our cities pleasant and productive places in the near and further future? As noted, skilled workers are key in providing an answer, but they are of course not the only persons inhabiting the city. Their central position

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justifies the special attention given to them in this research, but cities must of course be attractive and productive for all. To investigate the main research question we have to consider the preferences of workers. But we also have to consider the constraints. Many things that are appreciated by inhabitants of urban areas are costly. Climate change calls for attention, and policy reactions will have important consequences for land use that have to be taken into account. Money and space are scarce and in densely built areas like the Dutch cities, land uses compete with each other for these scarce resources. In urban land use, real estate is often involved and long term consequences are therefore important to take into account.

Information about the preferences of those concerned is crucial for making the right choices. What are important aspects of modern urban life and if not all desires can be realised, which tradeoffs can be made? Economists have developed techniques for addressing these questions, but they do not always address the issues that planners – and they are the specialists in urban development – think are important. We will therefore go beyond the standard issues addressed in conventional revealed preference techniques and investigate the possible importance of aspects that are not standard in economic models, but are considered as important by urban planners and architects. Stated preference techniques are ideal for this purpose as they allow a researcher to collect a lot of information by offering a sequence of choices to the same respondents. The choice alternatives are not restricted to existing situations, but can refer to possible future developments. In contrast, revealed preference studies usually have to work with single-choice information under circumstances over which a researcher has no control.

One of the reasons why highly educated workers play a key role in economic and urban development is that they may be more mobile than others, though evidence for this so far rather comes from the US than from Europe. They can choose a different city in the same country, but the possibility to move to a different country, in Europe or even in another continent, becomes increasingly relevant. As mentioned before, highly specialised skilled jobs may only be located in a limited amount of locations per country, most often in or near the largest cities. The direct competitors of Amsterdam and Eindhoven in knowledge-intensive sectors are probably rather foreign cities than other Dutch cities. It is therefore important to investigate the preference for Dutch cities in comparison to relevant alternatives in other countries and also here stated choice techniques provide a useful addition to information about actual migration behaviour. The international perspective is of key importance here.

Stated preference methods have been criticised for running the risk of collecting less useful information because respondents do not feel the same incentives as in the real world when making their hypothetical choices. However, consensus is growing that these disadvantages can be avoided to a substantial extent by keeping the choice alternatives close to those with which the respondent is familiar, for instance by letting one of the alternatives be his or her current situation (see e.g. Rouwendal and Meijer, 2001). Since not all preferences can be realised, we focus on measuring the trade-offs workers are willing to make. Stated preference techniques also allow one to measure aspects of social cohesion, for instance as preferences with respect to demographic composition, social diversity et cetera.

To study to which extent the preferences can be realised in actual urban areas, we have to introduce the constraints. When doing so, we have to move from the individual level to that of the city as a whole. Most cities exist already for a very long time and land use decisions in the past have important consequences for the present and future. The pattern of the streets, the location of

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residential and work areas, the presence of cultural heritage and of natural amenities are all important for the possibilities to improve the liveliness and liveability of cities. In order to deal with these complex issues, economists build models that give stylised descriptions of the phenomena they would like to address. This route will also be followed here, and the models that will be constructed focus on the way preferences with respect to residential location translate into the distribution of a heterogeneous population over an urban area. The preferences of the individual actors are the driving force of the model. The constraints imply that choices have to be made. Past decisions about land use, prices or other allocation mechanisms (rationing on the rental housing market and land use restrictions on the land market) direct these choices and the allocation of workers over the urban area.

An important feature of the sorting models that we will employ is that they focus on the structural relationships: preferences, budget constraints, land use patterns and amenities. This gives such models a substantial advantage over conventional hedonic models. These hedonic models focus on house prices in a particular market equilibrium. These prices will probably be sensitive to policy measures like the creation of more open space or the change of a brownfield into a new residential area, which makes such models less suitable for policy analysis because some of the parameters should be expected to take on different values as a consequence of policy changes. Structural models avoid this complication by concentration on parameters that are invariant to policy changes, and determine policy relevant variables like the willingness to pay for urban amenities on the basis of these structural parameters.

In the research proposed here, we will investigate consumer preferences in two different and complementary ways: through the stated choice experiments conducted in the research discussed above and by analysis of observed behaviour through the estimation of a sorting model (Bayer and Timmins, 2007). We will compare the results of both investigations. Differences in outcomes point towards shortcomings in the techniques used that will be further investigated in an attempt to improve the quality of the research. We will use the findings of a recent literature that compares and integrates outcomes of revealed and stated preference analyses and use both to formulate versions of the models that will be used for policy simulations.

The sorting model will first be estimated on the basis of the observed choices of urban actors. The estimated model provides insight into the driving forces behind the existing situation. It explains why house prices in some areas are higher than others, why unskilled workers are disproportionately located in some parts of the city, while the majority of skilled workers live elsewhere. We will compare the results of this 'revealed preference' approach with those of the stated preferences and combine both sources of information in the version of the model that will be used for policy analyses. Since the model is based on what economists call structural parameters (whose values do not depend on the prevailing urban policy) it can be used to get an idea of what the city would look like, in terms of house prices and demographic composition of neighbourhoods, if certain policy measures were taken. Such counterfactual analyses can be carried out for various possible policy scenarios, for instance changing brownfields into residential areas or parks, transforming empty office space into apartments, stimulating denser city centers instead of providing more public space, increasing the possibilities for shops, cafes, restaurants, et cetera. The detailed measures must be evaluated against the background of a macro-economic development path that can be related to long term studies of, for instance, ter Weel et al. (2010).

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To make the results as relevant as possible for policy purposes, knowledge of the important issues that have to be addressed in the research on preferences as well as in the construction of the models is, of course, a *conditio sine qua non*. A good knowledge of the international literature is necessary to feed these parts of the research, as well as information about experiences in other European countries. At the start of our project, a meta-analysis of existing studies on urban development with special attention for the role of highly skilled workers will be carried out to extract the main findings. Contacts with universities in Finland and Denmark will be used to be able to focus on issues of special interest for the effectiveness of policy measures. Much attention will also be devoted to dissemination of the results of this research to policy makers. For this purpose a connection will be made with the 'Land Use Scanner'-model, a grid-based, policy-oriented Geographical Information System (GIS) that has already proven its decision-support value for policy analysis in the Netherlands while being applied in a large number of policy-related research projects. These include simulations of future land use following scenarios (e.g., Dekkers and Koomen, 2007), the evaluation of alternative locations for a new airport (Scholten et al., 1999), the preparation of the Fifth National Spatial Strategy (Schotten et al., 2001) and the development of spatially-explicit climate adaptation strategies for the Netherlands (Koomen et al., 2008). This model will be used to provide information about the initial situation that is used as an input for the model computations. The outcomes will then be transferred back to the Land Use Scanner. In contrast to the standard output of economic models, the Land Use Scanner visualises the results using detailed maps and spatial indicators.

Summarising, our research will consist of four parts:

- I) A meta-analysis of the role of knowledge and skills in urban development that uses the US and European literature as a background aims at policy relevance for the Netherlands and Europe and concentrates on four city-regions: Helsinki, Copenhagen, Amsterdam en Eindhoven. Expert knowledge from these city-regions will be used through the involvement of local stakeholders.
- II) An extensive stated choice study that focuses on the preferences of highly educated Dutch workers with respect to residential location, paying special attention on urban amenities. The focus on highly educated workers implies also an interest in the differences between their preferences and those of other workers. This study will be done in the city-regions of Amsterdam and Eindhoven and be compared to similar research outcomes from Helsinki.
- III) The development of a model structure that can be used to analyse actual choice behaviour of workers in various urban areas. The model will be applied to the Netherlands as a whole, using municipalities as the basic geographical area, and to three specific urban areas, Amsterdam, Eindhoven and Copenhagen, using smaller spatial entities.
- IV) The project will culminate in the development of final versions of the models that integrate results from stated choices as well as revealed preferences studies, and their use in the analysis of a series of policy scenarios that will be formulated in discussions with local stakeholders. Dissemination of the results will be facilitated by the use of GIS and a connection with the Land Use Scanner. The ultimate product of the research can be used as a decision support system for 'gebiedsontwikkeling'.
- V) Coordination and dissemination. The main applicant will be responsible for project coordination, management and dissemination, in close collaboration with the leaders of the work packages. A part-time (1 day a week) project manager will assist the main applicant and work package leaders in the coordination and management of the project.

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c) Multi-disciplinary and integrative approach

The research that has been described above draws heavily on a number of tools developed in different disciplines. Meta analysis is an important multidisciplinary technique that systematises literature reviews. Stated preference analysis is used in a large number of fields ranging from marketing to time use analysis. Economists initially had important reservations against this tool, but they have gradually changed their opinion. Models are perhaps the most distinguishing part of the economist's toolkit, but they are also used in other disciplines like (economic) geography and regional science. One of the great achievements of Paul Krugman was to integrate these fields by formulating his core-periphery model that explains agglomeration as the path-dependent outcome of rational economic behaviour. It is almost needless to say that GIS is a truly interdisciplinary toolbox that has proven its value in a large number of disciplines. In summary it may be said that this project uses tools developed in a number of different disciplines to integrate them into a research endeavour that will be useful for urban policy making.

Sako Musterd leads the programme group Urban Geographies that is part of the Department of Geography, Planning and International Development Studies of the University of Amsterdam; Marco Bontje is member of that same programme group. This programme group collaborates in research and teaching with colleagues in urban and regional planning and economic geography. Moreover, it is part of the multidisciplinary Centre for Urban Studies in which geographers, planners, sociologists and political scientists meet and collaborate. Jan Rouwendal works at the department of Spatial Economics of Free University Amsterdam that also covers transport, environmental economics and geographical information systems. DTU (Copenhagen) is a polytechnic that concentrates on urban transportation issues. The geographers of the University of Helsinki frequently collaborate with colleagues from other disciplines like economy and sociology.

d) Relevance to Society and Policy

Despite the rapid development of ICT and a substantial decrease in transportation costs, cities have become more and more the centres of economic development in modern economies. Skilled workers and their interactions with similar and other workers play an important role in the functioning of these urban economies. An attractive city with many skilled workers has better possibilities to react flexibly to changing circumstances in a globalising world, and is also a good place to be for all kinds of other people. While the academic debate on whether or not highly educated workers are increasingly mobile is still on-going, it is of great importance to ensure that Dutch urban centres stay or become competitive in the sense of attracting and retaining skilled workers and the companies they work for. There is thus a substantial social interest in knowledge about the functioning of cities and the effectiveness of various possible policy measures that attempt to shed more light on appropriate ways to react to these challenges. This is the main purpose of the research proposed here. The dissemination of the results will get special attention through the development of an interactive decision support system that visualises the policy scenarios and their outcomes through the use of 4D-GIS.

e) International link and collaboration

The revival of cities and the growing importance of the connection between cities and skills is a worldwide phenomenon. We will try to benefit from analyses and experiences elsewhere through an extensive literature study and close collaboration with two highly-rated universities in Finland and Denmark. We are planning meetings in Amsterdam with our Danish and Finnish project partners at the start and the end of the project and at frequent intervals in-between. The project leaders of the work packages and the post-docs working in those work packages at UvA and VU will also meet with their work package colleagues in Copenhagen and Helsinki. Our Danish and Finnish colleagues will be involved in writing joint academic and professional publications, in the organisation of a conference at the end of the project and in other means of dissemination.

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f) Data to be used

For the stated preference choice survey, we will collect data through a survey. To effectively reach the right target group, we need access to databases with addresses and/or e-mail addresses, e.g. alumni databases of higher education institutes or list of personnel of knowledge-intensive companies; we will also make use of professional and social networks like branch organisations, LinkedIn groups etc, or existing panels like the Stadspanel of O+S Amsterdam. The models to be estimated will make use of the Sociaal Statistisch Bestand (SSB) and WoON for the Netherlands and from Danish register data. No additional data are needed for the GIS application as the Land Use Scanner already contains a very broad collection of datasets, for example land use, spatial policy data, accessibility maps and much more, covering the whole of the Netherlands.