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Skills and cities: knowledge workers in Northwest-European cities

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Abstract: In the early 21st century, attracting knowledge workers has become an essential ingredient of urban competitiveness strategies. Such strategies are often based on theories claiming that cities should attract highly skilled talent to stay or become economically successful. Such theories have meanwhile met with considerable criticism and empirical evidence seems to make the assumptions of these theories doubtful. The most frequently seen argument is that talent moves to places where there are jobs. However, if the focus shifts from attracting to retaining or from 'necessary conditions' to additional preferences, new avenues for policy and research open up. In this article we will first review the debate so far about what attracts and retains knowledge workers. We will then add recent empirical evidence to this debate from a survey of knowledge workers in the city-regions of Amsterdam and Eindhoven. Our survey results make clear that 'knowledge workers' are a highly diverse category in which we should distinguish sub-groups with quite contrasting residential preferences. These preferences should be met to retain them to the area they settled in.

Keywords: knowledge workers; residential preferences; urban competitiveness strategies; amenities; residential attractiveness; creative class; consumer city; Europe; Amsterdam; Eindhoven.

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Biographical notes: Marco Bontje is an Assistant Professor of Urban Geography at the University of Amsterdam. In recent years his research has focused mainly on creative knowledge cities and urban geographies of growth and decline in Europe. He has also done research on polycentric urban regions and sustainable urban and regional development. He was one of the researchers of the higher educated location preferences (HELP) project on which this article is based.

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1 Introduction

Since the early 1990s, the attractiveness of cities for knowledge workers and for the economic sectors they work in has received (and is still receiving) growing scholarly attention. This is a logical response to the increasing political priority given to making or keeping cities and city-regions attractive for the fast-growing ‘cognitive-cultural economy’ (Scott, 2008), including sectors like creative industries, high-tech and knowledge-intensive production, and advanced producer services. The transition towards this cognitive-cultural economy is linked to three major shifts: a geographic shift from cities to polycentric urban regions, a shift in economic specialisation from manufacturing to services, and a shift in labour force composition from blue-collar factory workers to white-collar high-skilled workers (Phelps and Ozawa, 2003). Some regions, however, are much better capable to adapt to these shifts than others, resulting in increasing interregional and international socio-economic inequalities and an increasing competition for investments, companies and high-skilled workers between city-regions.

A significant part of this debate so far is about what is most decisive in attracting knowledge workers: jobs or amenities? The debate tends to be dominated by US scholars and many of them seem to represent two opposite ‘camps’. The ‘amenities’ camp emphasises the importance of attracting knowledge labour to cities. Highly simplified their philosophy could be summarised as ‘jobs follow people’. They argue that cities should offer an attractive set of amenities to attract knowledge workers, which in turn will then contribute to economic growth. Such amenities may include an attractive living environment, a rich offer of culture and leisure, higher education, a high level of service provision and a well-functioning and attractive housing market. Prominent authors include Florida (2002; 2014), Clark et al. (2002), Glaeser et al. (2001), Glaeser and Gottlieb (2006) and Glaeser (2011). The ‘jobs’ camp rather emphasises the importance of attracting and retaining firms. They turn the formula around: ‘people follow jobs’. Cities with the right economic structure and sufficient job opportunities will be most successful in attracting and retaining knowledge workers. Amenities and quality of life will no doubt add to a city’s attraction, but cities cannot attract knowledge labour with amenities and quality of life alone; they should offer attractive jobs and career opportunities. The most prominent representatives of this ‘camp’ are Scott and Storper (Scott, 2010, 2014; Storper and Scott, 2009).

Meanwhile, debates about the attractiveness and competitiveness of cities in the ‘cognitive-cultural economy’ in general, and their attractiveness for knowledge workers

in particular, have spread across the advanced capitalist world. While US authors keep dominating the scene, the amount of and influence of contributions from Europe, Canada, Australia, New-Zealand, and East and Southeast Asia has grown. Such contributions either apply the US theories and concepts in non-US contexts providing empirical evidence supporting or questioning these theories, or try to come up with adapted or alternative theories, though so far the latter seems to happen less often than the former.

In this article we will first assess the current state of the art of this debate, focusing mostly on its relevance for Northwest-European cities, the context we are most familiar with. Afterwards we will present empirical evidence from a recent project in which we have compared the residential attractiveness of the city-regions of Amsterdam and Eindhoven in the Netherlands for knowledge workers. While both city-regions are major hubs of the cognitive-cultural economy, they specialise in contrasting directions: the Amsterdam region especially stands out as an advanced producer services region, while the Eindhoven region excels especially as a high-tech production region. Whereas Amsterdam has long had a diverse supply of creative industries, Eindhoven has a smaller but growing creative industries sector within which activities are mainly related to design and advertising. Both cities are also highly different in size and character. Amsterdam is the largest city of The Netherlands (830,000 inhabitants in early 2016) and is both the official capital and the main cultural centre of The Netherlands, with a historic inner city. Eindhoven is much smaller (220,000 inhabitants in early 2016) and lacks a historical core. Rather, the city has the feel of a large village, although recently investments have been targeted at cultural amenities and more urban residential environments. These differences have several implications for the extent to which these regions are attractive for categories of knowledge workers: creative vs. high tech, 'natives' vs. international migrants, students and recently graduated vs. workers in more advanced career stages, etc. Next to this city-regional comparison, other parts of the project looked at the Netherlands as a whole as the national context of these two city-regions, while we also made an international comparison with the city-regions of Copenhagen and Helsinki. The limited scope of this article does not allow to present the results of this project in full detail, so we will focus on the results of our survey in the city-regions of Amsterdam and Eindhoven. This also implies that we will focus on stated preferences instead of revealed preferences. A more detailed and complete account of this project's results can be found in a recently published edited volume that we will frequently refer to throughout the article (Musterd et al., 2016).

2 Attracting knowledge workers with housing and amenities?

2.1 Who are the knowledge workers?

We use the term 'knowledge workers' for people with higher education qualifications (university or higher professional diplomas), working in creative or knowledge-intensive industries. The term 'knowledge workers' is frequently used in literature (Benson and Brown, 2007; Chica and Marmolejo, 2016a; Horwitz et al., 2003; Tremblay and Darchen, 2010); other frequently used and closely affiliated terms are 'creative knowledge workers' (Clifton and Cooke, 2009; Martin-Brelot et al., 2010; Musterd and Deurloo, 2006) or 'creative class' (Florida, 2002, 2014; Boschma and Fritsch, 2009; Hansen and Niedomysl, 2009; Lawton et al., 2010). Although these concepts are obviously

overlapping, there has been considerable debate about how to define and analyse them. Horwitz et al. (2003, p.31) focus on the knowledge and skills in their definition of ‘knowledge workers’: according to them knowledge workers “have a high level of skills/education, with technological literacy, high cognitive power and abstract reasoning”. People with such skills and knowledge might be found in any economic sector. Others prefer to focus on workers’ professions and tasks than on their formal education levels. Benson and Brown (2007), reviewing the definitional debate, propose three dimensions of ‘knowledge work’: it is work of a varying and dynamic nature; with a high degree of reciprocal interdependence with other tasks and workers in their team, organisation or project; but also with a high degree of autonomy and uncertainty in the decision making process.

Other concepts and approaches try to combine education level and skills and type of work with the economic sectors in which such workers can mostly be found, and what these sectors might have in common. The ‘creative class’ is one of the most influential concepts in this category in the early 21st century. According to Mellander and Florida (2006), having a ‘creative class occupation’ would be a better measure of human capital than level of education. However this ‘creative class’ comprises a broad and highly varied range of sectors and occupations. In response to Florida’s introduction of the creative class concept, many critics have argued that this class can impossibly be seen as a coherent whole and at least sub-groups should be distinguished. In fact, Florida himself also did this from the very start, making a division between the ‘super-creative core’ (e.g., ICT specialists, scientists, artists, architects, designers) and ‘creative professionals’ (e.g., workers in management, financial or legal services, healthcare, high-end sales). Some of his critics argue that only the ‘super-creative core’ could really be considered creative. Krätke (2010), for example, proposes a dichotomy between ‘scientifically and technologically creative occupations’ and the ‘dealer class’, of which the latter (people working in finance, real estate, management and consultancy) should not be considered part of a ‘creative class’. Kotkin (2000), already some years before Florida, proposed another dichotomy, between ‘bohemians’ working in creative industries and ‘nerds’ working in ICT. Several others argued that even such dichotomies are too rough (e.g., Kooijman and Romein, 2007) or even that the supposed creative class is not much different from ‘ordinary working people’ (Atzema, 2007).

2.2 Attraction factors for knowledge workers: how (un)important are ‘soft factors’?

For our analysis, more important than the exact boundaries of our target group are the suggestions by Florida and others that we are dealing with a group with special characteristics and preferences and the implications this should have for urban development policies and strategies. Where do knowledge workers prefer to live and work and what determines their location choices? ‘Classic’ location theory, mainly focusing on company location and investment decisions, stresses ‘hard’ factors like infrastructure, accessibility, connections and networks, labour availability, availability of affordable business space, tax regimes etc. Preferences and choices of workers are much less addressed in such ‘classic’ location theory, but there are definitely ‘hard’ factors for workers too, like job availability, career opportunities and costs of living (Musterd and Kovacs, 2013; Musterd and Murie, 2010; Sassen, 2002; Storper, 1997). Other theories and empirical analyses add the importance of social capital and social networks, both for

companies and for workers. The location decisions of firms can partly be explained by business networks established in the past, but for individuals like entrepreneurs and employees, personal relationships and life trajectories can also play an important role (Grabher, 2002, 2004; Musterd and Murie, 2010; Chica and Marmolejo, 2016b).

In the early 2000s, several economists and social scientists challenged this 'classic' location theory, arguing for the importance of 'soft' factors in location decisions of workers. As already briefly addressed in the Introduction section, these people-based approaches argue that 'jobs follow people' rather than (as in classic location theory) 'people follow jobs'. Three of the most influential approaches within this people-based perspective are Florida's creative class, Glaeser's consumer city, and the key role of amenities in urban growth as argued by amongst others Clark.

Florida's creative class theory, introduced in his bestseller *The rise of the creative class* (Florida, 2002) suggests that attracting 'talents' is the crucial factor for urban economic growth. 'Talents' in his view are not just defined as the highest educated, but also (and maybe even more) as the most creative people. A concentration of talented people could lead to more creativity and therewith to more economic growth. According to the creative class theory, creative talents flock to metropolitan areas because they would particularly appreciate tolerant and diverse environments. Both tolerance and diversity should be interpreted in multiple ways and in their interrelatedness: tolerance for different ethnicities, cultures, lifestyles and sexual orientations, and diversity not just of people but also of activities and amenities. Other researchers like Wojan et al. (2007) also found evidence that the growth of sub-groups within the creative class might be inter-related, suggesting that creative people attract more creative people. Companies and investors, in turn, would prefer to settle in and/or invest in those metropolitan areas with most creative talents. A city's ability to successfully attract the best and brightest creative talents would be a major determinant of its competitive advantage. Florida, inspired by Jacobs (1961, 1969), sees cities as the best place for innovative industries because of their heterogeneity, fostering creativity and innovations (Helbrecht, 2004). Universities might play an important role as well as hubs of present and future creative talent, next to other amenities appreciated by those with high human capital (Mellander and Florida, 2006). Florida and fellow creative class researchers also stress how places and spaces of work, home and leisure increasingly become mingled and how borders between spheres of life gradually disappear. The importance of 'third places' and all kinds of novel hybrid working environments is highlighted: creative talent apparently would not only prefer to live differently, but also work differently, and working environments should adapt to their lifestyle and work style. In the aftermath of the creative class hype this has meanwhile led to another strand of the debate, exploring the links between creative industries, creative class and knowledge-based urban development (Cabrita et al., 2013) and developing highly sophisticated models of creative live-work environments like the 'creative city matrix' (Gridneva and Noennig, 2014).

The 'consumer city' approach sees human capital in general and the availability of skilled workers in particular as the main driver of economic growth. Amenities would play an important role in attracting these skilled workers. Some of the amenities particularly highlighted in the US context are climatic, natural and cultural amenities; climate being a key factor for Sunbelt cities and cultural amenities for Northern cities (Glaeser et al., 2001; Glaeser, 2004). The urban resurgence of US cities since the late 1980s, and differences in success between cities, could be explained more by consumption than by production factors. Glaeser and Gottlieb (2006) point at amongst

others declining crime rates, rising incomes, rising education levels, and an increasing demand for cultural amenities connected to these trends. Cities and city-regions with the richest variety of amenities and consumer goods were most successful in attracting middle and higher income groups. Additional explanatory factors mentioned by Glaeser and his colleagues are attractive built environments, quality of public services and liveability. After an impressive series of articles about various aspects of urban resurgence and the consumer city, his book *Triumph of the City* (Glaeser, 2011) could be seen as his celebration of the ideal city as he would like to see it. At first sight, Glaeser's view on cities and urban economies has a lot of common with Florida's view. However, Glaeser has criticised Florida's creative class thesis (Glaeser, 2004) and they have some clear disagreements as well, for example about what type of built environment they prefer (high-rise complexes vs. smaller-scale neighbourhoods with vibrant street life), what is more important for economic growth (creative capital vs. human capital), and liberal progressive (Florida) vs. more orthodox/conservative (Glaeser) views on urban development (Peck, 2016).

Clark and his colleagues dominate another strand of the recent debate, affiliated to both the 'creative class' and the 'consumer city' but slightly deviating from it in terms of which amenities are considered important and how they analyse the process of urban and economic development. Like the 'consumer city' literature, Clark et al. (2002) place amenities centre stage as the crucial drivers of urban economic growth. The most successful cities, in their view, are 'entertainment machines'; those cities with the highest-quality offer of amenities will be most successful in attracting human capital. 'Amenities' in their view include a broad and varied range of items, from attractive residential environments to retail and from culture and nightlife to sports and outdoor recreation. Several more recent publications seem to follow more or less in their (and partly also in Florida's and/or Glaeser's) footsteps. Yigitcanlar et al. (2007) also highlight urban amenities as dominant attraction factors for knowledge workers, in particular quality of life, quality and urban diversity; Currid (2007, 2009) emphasises the economic importance of arts and cultural amenities; Lee and Nathan (2010) highlight cultural diversity as a source of economic strength in London; van Duijn and Rouwendal (2013) point at the importance of cultural heritage for urban attractiveness. In his conceptual framework of knowledge-based urban development, Yigitcanlar (2011) presents socio-cultural development (including social and human capital, culture and diversity) and enviro-urban development (including sustainable development and quality of life) as two of the four pillars of knowledge-based urban development.

All three 'soft factors' approaches have meanwhile faced substantial critique. Florida, Glaeser, Clark and others putting consumption, amenities, tolerance and/or diversity centre stage have been criticised for overestimating such factors and underestimating 'hard' or 'classic' location factors in general and employment opportunities in particular. 'Soft' factors may also add to the attractiveness of cities, but these factors alone cannot make the difference between attractive and unattractive cities. According to Storper and Scott (2009), regional growth crises are rather caused by a lack of jobs than a lacking inflow of people. Such crises cannot be solved by attracting more highly qualified migrants alone, and moreover, the mobility of highly qualified migrants should not be overestimated. Talented people will rather choose to stay put in a region where they acquired their (tacit) knowledge, skills and networks than move to a region with a lack of employment opportunities. Scott (2006) adds that economic networks and regional production systems are more powerful attraction and retention factors for talent than a

region's social and cultural climate. The limited mobility of talent may be even more true for Europe than for North America. Migrating across city-regional boundaries, let alone across state boundaries, is much less common in Europe and knowledge workers are no exception to this general migration pattern. In the European context, 'hard' factors like employment opportunities and costs of moving are decisive factors for migration decisions of knowledge workers. 'Soft' factors appear much less important, as several European researchers have found in different European countries (e.g., Miguelez and Moreno, 2014; Marlet and van Woerkens, 2007; Martin-Brelot et al., 2010). In some studies a third category of factors is highlighted, described as either 'social factors' or 'personal networks' or 'personal trajectories'. This regards rather 'basic' factors which may also be underestimated in the 'soft factors' approaches, like place of birth and growing up, place of study, networks of family and friends etc. (Martin-Brelot et al., 2010; Hansen and Niedomysl, 2009). Niedomysl and Hansen (2010) suggested that 'soft factors' like amenities should be seen as preferences instead of as needs or demands.

There are several other critical reactions to the 'soft factors' approaches in general, but Florida's 'creative class' in particular. A prominent critique is that the role of creativity is overestimated. What is the real added value of 'creative capital' to 'human capital'? To what extent are creative people 'special'? Markusen (2006) found that the most artistic cities in the USA are not the fastest-growing cities, and that high-tech regions with relatively few artists like Silicon Valley still managed to grow very fast. Boren and Young (2013) concluded for the Stockholm region that even artists considered job opportunities and professional networks more important than 'soft factors'. Also the existence of a 'creative class' is questioned. Can such a broad and diverse category (about one-third of the labour population in advanced capitalist countries) really be seen as a coherent whole, sharing the same behaviour and preferences? (Nathan, 2008; Servillo et al., 2012).

In addition, Florida's evidence for the importance of 'soft factors' and 'quality of place' largely consists of hard-to-measure dimensions that can hardly be measured with indexes and indicators (Musterd and Ostendorf, 2004; Kooijman and Romein, 2007; Storper and Manville, 2006). Other critiques focused on the societal and political implications of following Florida's 'recipe for growth'. Urban and regional economic growth strategies focusing on the 'creative class' tend to be exclusionary, neglecting a large share of the urban population and labour market, and run the risk of increasing polarisation between and higher income groups on the one hand and lower income groups on the other. Such policies may also lead to counterproductive inter-municipal and inter-regional competition for talents and companies (Bontje and Musterd, 2009; Bontje et al., 2011; Peck, 2005; Scott, 2008). Finally, some authors doubt the applicability of Florida's 'one-size-fits-all' approach for urban policies. Not all cities can become creative cities, and even those that can would benefit much more from tailor-made strategies taking each city's unique historic development paths and current strengths and weaknesses into account (Musterd and Kovacs, 2013; Pratt, 2008; Hall, 2004; Peck, 2012). Peck (2005) adds that Florida's 'creative class' may in fact be just another label for 'mainstream' neoliberal and entrepreneurial urbanism, while he may meanwhile also have become more consultant than academic. Interestingly, in a recent article Peck (2016) presents a rather similar critical analysis of the work of Edward Glaeser.

2.3 Residential sorting of knowledge workers within city-regions: recent European evidence

Either inspired by or in critical reaction to the international debate outlined above, many European researchers have analysed whether or not concepts like ‘the creative class’ and the characteristics and preferences linked to such categories could be applied to European cities and city-regions. Although their definitions of ‘knowledge workers’ are sometimes different and (partly because of that) these analyses partly arrive at different conclusions, one common finding seems to be that there is no such thing as one coherent ‘creative class’. The mobility behaviour and preferences of sub-groups within the creative class are too diverse to see this ‘class’ as a meaningful overarching whole, at least in the European context. Moreover, the residential preferences of knowledge workers are definitely not always as urban as the US theories suggest. Different parts of metropolitan regions attract different categories of knowledge workers for different reasons; and even locations beyond metropolitan boundaries may be attractive for some knowledge workers. ‘Trade-offs’ of attraction and/or retention factors include the ‘usual suspects’ like jobs, career opportunities and urban amenities, but also factors less often associated with knowledge workers like appreciation of quietness, space or social cohesion (Lawton et al., 2013; Andersen et al., 2010). The emergence of teleworking, including increasing possibilities to work from home and/or from more than one location during the work week, may complicate the pattern even further. Merisalo et al. (2013) found that teleworking in the Helsinki region is more common in knowledge-intensive occupations. This may reduce the need to live in urban areas since with telework you could work practically anywhere, either the whole work week or parts of it.

Within the ‘creative class’ and similar conceptualisations of ‘knowledge workers’, empirical findings from Europe and to some extent also from other advanced capitalist parts of the world (e.g., Bendit et al., 2011 in Israel and Verdich, 2010 in Australia) point at various relevant differentiations that help explain the diversity of residential preference and residential mobility patterns. Socio-demographic characteristics, economic sector and occupation and personal tastes and lifestyles should be taken into account. According to this differentiation, younger knowledge workers are more urban-oriented than older knowledge workers (Lawton et al., 2013; Hansen and Niedomysl, 2009). This is closely related to events in the personal life cycle like starting or completing a study, starting a career and/or starting a family. Such events influence residential preferences and location choices. A general pattern is that young people move to cities during their study and stay there in the first years on the labour market, but leave cities once they have made some career and/or when they get or expect their first child (Andersen et al., 2010; Hansen and Niedomysl, 2009; Lawton et al., 2013; Bendit et al., 2011; Frenkel et al., 2013; Verdich, 2010). There may be some difference in this pattern for international knowledge migrants. Beckers and Boschman (2013) found that international knowledge migrants tend to have a stronger urban orientation than ‘natives’, but also for them life events like starting a family may decrease this urban preference. Furthermore, artists and people working in creative industries are more urban oriented than people working in other knowledge-intensive sectors like ICT, high-tech or finance (Markusen, 2006; Lawton et al., 2013; Musterd, 2002; van Oort et al., 2003). In line with this, Kotkin (2000) even coined the term ‘nerdistans’: safe, quiet suburban living environments preferred by technical workers in contrast to the highly urban preference of creative workers. However, others like Boren and Young (2013) challenge the highly urban preference of

creative workers, which may also even suggest that the residential preferences of the supposed 'creative class' and sub-groups within it are maybe not much different from the population as a whole.

In our analyses for the city-regions of Amsterdam and Eindhoven, we have found additional evidence supporting critical findings listed above. The next sections will present some of the main findings of our analyses, focusing on differentiation within the 'creative class' between sectors, professional groups, socio-demographic groups and the knowledge workers' origin ('native' workers vs. international migrants).

3 Stated residential preferences of knowledge workers in the Netherlands: the city-regions of Amsterdam and Eindhoven

3.1 Introducing the survey and the two city-regions

The city-regions of Amsterdam and Eindhoven are the two main hubs of knowledge-intensive industries in the Netherlands. The regions and their core cities have quite different socio-economic profiles and economic specialisations though, rooted in their contrasting historic development paths. Amsterdam's strengths as the country's main centre of trade, finance, culture and creativity can be traced back to at least the 17th-century 'golden age' and partly even already earlier (Kloosterman, 2004; Deinema, 2012; Bontje et al., 2011). The city-region is the Dutch leader in almost all knowledge-intensive sectors, with two major exceptions: architecture, in which Rotterdam is number one (but closely followed by Amsterdam), and high-tech production, which happens to be the major strength of the Eindhoven city-region. Eindhoven is a much more recent city, a typical example of late 19th and early 20th century industrialisation. Contrary to many other rapidly emerging industrial hubs of that time, though, Eindhoven has managed to modernise itself and to remain an internationally competitive hub of high-tech and innovation. A deep but short-lived crisis in the 1980s and early 1990s was followed by a spectacular revival since the mid-1990s. Fernandez-Maldonado and Romein (2010) describe this as 'the reinvention of Eindhoven'.

Looking back at the attraction and retention factors for knowledge workers discussed in Section 2, an initial expectation would be that Amsterdam would probably score considerably better in terms of urban amenities or 'soft factors', while both regions would probably score more or less equally well on the 'hard factors'. Both city-regions are well-equipped with all types of infrastructure relevant for knowledge-intensive industries and workers, and although Amsterdam is a more expensive place to settle for both companies and workers, the differences with Eindhoven in this are probably not decisive for location choices. Amsterdam, however, has a much richer offer of culture and entertainment, it is a more urban environment in terms of density and diversity, and its well-preserved historic built environment is definitely an asset compared to Eindhoven. Eindhoven may recently have improved considerably, though, in terms of urban amenities and attractive spaces to live and work for the knowledge-intensive sectors. Especially the mixed live-work area Strijp-S, a former Philips factory complex transformed into a lively hub of culture and design, is frequently highlighted as a 'best practice' of place-making for knowledge and innovation spaces (Pancholi et al., 2015).

The Amsterdam and Eindhoven knowledge-intensive economies have meanwhile become city-regional economies, considerably extending beyond their core cities. The Amsterdam city-region, for example, features major concentrations of advanced producer services at the city edges (especially the ‘South Axis’), but also outside of Amsterdam in former new towns (Almere, Hoofddorp) and around Schiphol airport, while the main focus of the media sector is in Hilversum, 20 km east of Amsterdam (Bontje and Kepsu, 2013). In the Eindhoven region, especially the neighbouring town of Veldhoven has become an important second knowledge-intensive hub because of the emergence of ASML, the world’s leading chip machine producer. Moreover, in both city-regions knowledge workers are definitely not only living in the core cities, but also in the sub-centres and suburbs surrounding them, and quite often even further away. For our survey, therefore, the Amsterdam Metropolitan Area (36 municipalities, about 2.5 million inhabitants) and the Eindhoven Metropolitan Region (21 municipalities, about 750,000 inhabitants) were our two case study areas; most of our respondents lived within those regions, but a significant part of them also lived elsewhere in the Netherlands, while working in the Amsterdam or Eindhoven region.

In each region we have surveyed four groups of knowledge workers:

- People working for large high-tech firms: Shell Technology Centre in Amsterdam and ASML in Veldhoven (Eindhoven region).
- People working for several creative industries (advertising, graphic design, architecture).
- a reference group of other higher-educated workers in both city-regions.
- a sample of foreign higher-educated workers obtained from the ‘expat centres’ of the two city-regions. We have to note, however, that also considerable shares of the three other respondent groups were of foreign origin.

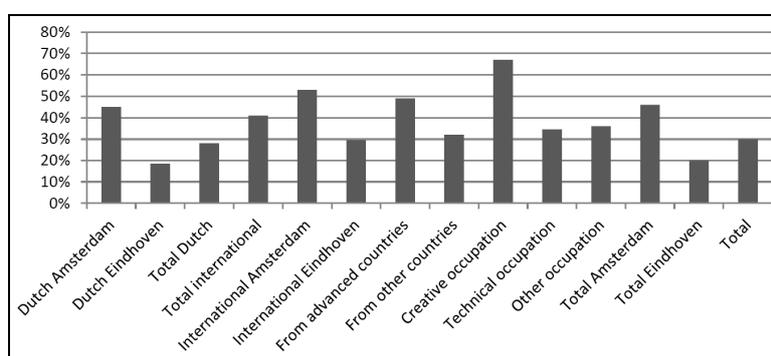
In total, 2,802 respondents participated in our survey, held in the year 2013. This sample enabled us to compare not only the two city-regions, but also several sub-categories within the broad overarching category of ‘knowledge workers’. In the following we will briefly report on some of the most striking similarities and differences and their possible explanations (see Boterman and Bontje, 2016; Sleutjes and Boterman, 2016 for a more complete and more detailed analysis). As mentioned before, we will focus mostly on the ‘stated preferences’ questions in our survey. These stated preferences were measured in several ways: respondents were asked to rank photos as well as neighbourhood names of city centre, city edge and suburban residential milieus, and to react to statements in which these milieus were compared. Next to this, we will briefly address the knowledge workers’ reasons to move to, and reasons to stay in, the city-regions of Amsterdam and Eindhoven.

3.2 Creative workers vs. high tech workers

Our survey results confirmed the differentiation of residential preferences between segments of the ‘creative class’, and especially the contrasts between creative workers and high tech workers, found in earlier empirical studies in Europe as discussed in Section 2.3. While most of these earlier studies focused on revealed preferences (actual moving behaviour), our survey focused on stated preferences. The fact that different

residential preference analysis approaches apparently lead to quite comparable results only seems to strengthen the argument to take the considerable differentiation within the creative class into account. Also in our survey sample, creative workers tend to be more urban-oriented than high tech workers (Figure 1). This difference in residential orientation is the combined effect of four, mutually influencing, dimensions: housing type, residential milieu, relative location in the city-region, and the relative importance of (urban or suburban) amenities. Creative workers in our sample preferred apartments, in (highly) urban residential milieus, in or close to the city centre. High tech workers on the contrary prefer detached or semi-detached houses, in city-edge or suburban residential milieus, and consider living close to their workplace more important than living close to the city centre. Moreover, creative workers consider cultural amenities much more important than high tech workers. We should add, though, that both creative workers and high tech workers consider other types of amenities more important: amenities important for everyone irrespective of profession or income like public safety, public greenspace and shopping facilities. Finally, a finding from our survey partially different from earlier empirical studies is that the high tech workers have the most distinct residential orientation, while the creative workers seem to differ from other higher educated workers of our reference group much less. This may be linked to earlier theories about new urban middle classes vs. traditional middle classes (May, 1996; Butler and Robson, 2003; Bridge, 2003, 2006): the creative workers seem to fit better in the new urban middle classes, while the technical workers may rather be part of the traditional middle classes.

Figure 1 Preferences for urban areas



Note: Differences between Dutch and international workers in Amsterdam and Eindhoven.

Source: Sleutjes and Boterman (2016)

3.3 Amsterdam vs. Eindhoven

Workers in Amsterdam, both Dutch and international workers, generally have a stronger urban preference than their counterparts in Eindhoven (Figure 1). The results for the Amsterdam city-region also seem to match better with the 'soft factors' and amenities approaches than those for the Eindhoven city-region. In the Amsterdam city-region, 13% of our respondents included factors related to the socio-cultural atmosphere of the region among the most important reasons to choose this region as their residence; in the Eindhoven region this was only 4%. Still, our results for both regions confirm the

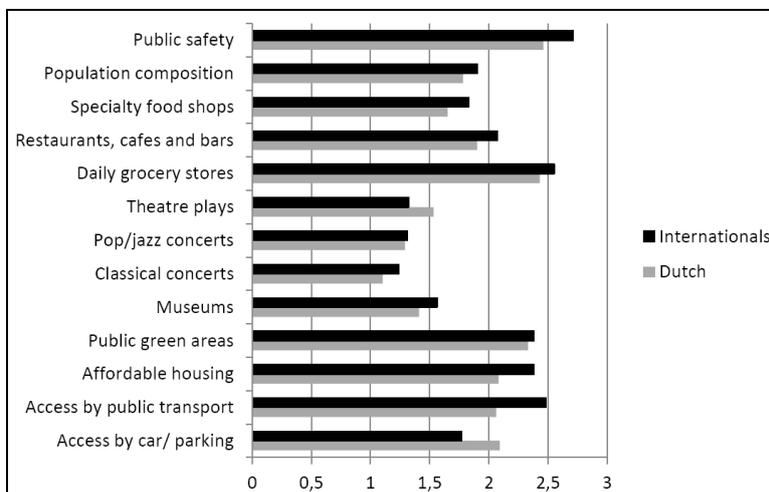
outcomes of earlier empirical studies in Europe (see Section 2.3): ‘hard factors’ combined with personal networks and trajectories contribute more to the explanation of residential preferences of knowledge workers than ‘soft factors’; and ‘soft factors’ only become more important once the knowledge workers have settled somewhere, so they are rather part of ‘reasons to stay’ than of ‘reasons to move’. In both regions, 25% referred to work-related reasons as part of the most important reasons to settle in the region. Reasons related to personal networks and trajectories were the most mentioned category in both Amsterdam and Eindhoven; however, in Eindhoven (56%) they appeared to be more important than in Amsterdam (44%). Especially the sub-category ‘I grew up here/I already lived here’ scored higher in Eindhoven than in Amsterdam (Musterd, 2014).

A part of the explanation for the different results for the Amsterdam and Eindhoven city-regions lies in their different socio-economic structure, Amsterdam being a more creative city-region and Eindhoven rather being a high-tech, innovative city-region. Some of the differences could also be explained as the result of ‘composition effects’: the Eindhoven city-region has a labour market in which technical workers are over-represented, although the city is also known for its creative sector and top position in (education in) creative design; the Amsterdam region has a highly diverse labour market. In addition, ‘selection effects’ could also play a role: the Amsterdam region has more highly urban residential milieus to offer than the Eindhoven region and the Eindhoven region has more suburban milieus than the Amsterdam region, which may attract more urban-oriented knowledge workers to Amsterdam and more sub-urban-oriented knowledge workers to Eindhoven (Boterman and Sleutjes, 2014).

3.4 *‘Natives’ vs. international migrants*

Just like creative workers may fit better in the ‘soft factors’ literature than high tech workers (see Section 3.2), international knowledge migrants seem to fit in that literature better than native Dutch knowledge workers. Still, also among international knowledge migrants we found considerable differentiation in their residential preferences. International knowledge migrants in our survey sample were generally more urban oriented than ‘natives’: they had a stronger preference for urban residential milieus in or close to the city centres (Figure 1), and a stronger appreciation of urban amenities like cultural facilities (Figure 2). This was true for both creative workers and high tech workers, though the creative workers among the international knowledge workers were the most urban oriented. Still, both in the native Dutch and the international migrants part of our sample, the majority of respondents preferred city-edge and suburban milieus. Also, despite their stronger urban preference, (semi-) detached dwellings were equally popular as apartments among the international knowledge migrants. To add to this diversity, migrants from different parts of the world appeared to have different preferences: migrants from the advanced capitalist world generally had a stronger urban orientation than migrants from developing countries. Finally, in line with the general contrasts between our two case-study regions discussed above (Section 3.3), international knowledge migrants in the Eindhoven city-region had a stronger preference for suburban residential milieus than their Amsterdam counterparts.

Figure 2 The average importance given to regional aspects, on a scale of 1 (low) to 4 (high); differences between Dutch and international workers



Source: Sleutjes and Boterman (2016)

3.5 Socio-demographic characteristics, personal trajectories and social networks

Last but certainly not least, we should take several individual and household characteristics of our respondents into account, and to what extent these characteristics help explain the differentiation between the two professional groups, the two city-regions, and two categories of origin ('natives' vs. migrants) we discussed above. In the debate about the supposed attractiveness of cities for knowledge workers, their socio-demographic diversity often seems to be overlooked. However, knowledge workers in many respects are 'just like normal people': they differ in age, gender, household type, stage of life etc., and these differences are also reflected in the diversity of residential preferences. In our survey, the results from earlier empirical studies largely seem to be reconfirmed: younger singles and childless couples have a stronger urban preference, households with children and older households have a stronger suburban preference (Table 1). The recent trend of 'family gentrification' (Boterman et al., 2010; Karsten, 2014) partly breaks through this general pattern, especially in Amsterdam, but even in that region, we found more households with children with a suburban than with an urban residential preference.

Next to differences between Amsterdam and Eindhoven, again also differences between creative and technical workers become apparent: for example, 'creative' households with children are more urban-oriented than 'technical' households with children. Finally, as mentioned before (Section 3.3), the personal trajectories of the knowledge workers and the stage of life (and career) they are currently in influence their residential preferences considerably. This also implies that their residential preferences may well change when moving from one stage of life to the next; however, since we only surveyed the knowledge workers at one point in time and had no retrospective questions, we could not study such stage of life effects.

Table 1 First residential preference for urban areas; differences according to demographic aspects, occupation and workplace

<i>Dependent variables</i>	<i>a) First preference urban area (All)</i>	<i>b): First preference urban area (only Amsterdam)</i>	<i>c): First preference urbana rea (only Eindhoven)</i>
Independent variables	Exp(B)	Exp(B)	Exp(B)
Age	.990	.984	.997
Households with children	.539***	.673	.425***
Single person households	1.501**	1.828*	1.321
High incomes	.977	.924	1.125
Low incomes	1.044	.838	1.208
University educated	1.684***	2.265***	1.229
Creative workers	2.850***	3.744***	2.166*
Technical workers	.521***	.390**	.665
Working in Eindhoven (ref. = Amsterdam)	.320***	X	X
International worker (ref. = raised in Netherlands)	1.488*	1.157	1.907**
<i>Constant</i>	<i>1.128</i>	<i>1.240</i>	<i>1.907**</i>
<i>R-square</i>	<i>.201</i>	<i>.166</i>	<i>.085</i>

Notes: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Source: Sleutjes and Boterman (2016)

4 Conclusions

In both the literature review and the discussion of results of our survey, we have questioned the disproportionate attention for and importance given to (urban) amenities for attracting knowledge workers to cities. This prominence of amenities-based approaches to urban attractiveness and competitiveness has gone at the expense of attention for attraction factors that are at least equally important. In the 'jobs or amenities' debate, our position would rather be that jobs *and* amenities are important for residential decision making processes of knowledge workers. However, at least in (Northwest-) Europe but probably also in other parts of the advanced capitalist world, the availability of sufficient high-qualified jobs and career opportunities is more important than the presence and quality of (urban) amenities. The amenities only become more important in a later stage of the process, when knowledge workers have to decide whether to stay in a city(-region) or to move on. Amenities, therefore, should probably rather be seen as retention factors, next to the lasting importance of job- and career-related factors, than as attraction factors. A possible policy implication is that it only makes sense to invest in urban amenities for knowledge workers in areas where sufficient jobs and career opportunities are already available for them. Trying to attract knowledge workers with amenities only, and then expecting that jobs will follow, will not work.

Next to 'hard factors' like jobs, career opportunities and costs and soft factors like amenities, we also should not underestimate the impact of personal life trajectories and social networks. In that respect, knowledge workers are probably not much different from people working in less knowledge-intensive segments of the labour market. Where you are born and raised, where you study, where your family and friends live, and life events like meeting your partner or getting children, determines your residential preferences more than either jobs or amenities. To some extent, this may be a 'typically European' phenomenon, since Europeans tend to be less mobile than North Americans; however, even North American knowledge workers are definitely not always as 'hyper-mobile' as Florida's creative class theory suggests.

Our own survey results add to what have meanwhile become a considerable amount of 'counter-evidence' to dominant US amenities-driven approaches to the attractiveness and competitiveness of cities and their regions. Next to bringing alternative explanations of what attracts knowledge workers to cities or regions to the fore, these empirical studies from Europe and other parts of the globe also highlight the differentiation within the broad category of knowledge workers in various dimensions. Residential preferences of knowledge workers differ between professional groups, socio-demographic categories, countries of origin etc., and they tend to change over time when people enter different stages of life. This differentiation implies that urban and regional policy-makers should not try to create a 'one-size-fits-all' residential environment for 'the' knowledge workers or 'the' creative class; rather they should provide a mix of contrasting residential environments meeting the demands of a variety of knowledge workers.

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