Intra-urban polarisation due to tertiarisation of the urban labour market? Evidence from urban regions in Germany

Abstract

According to the so-called “polarisation hypothesis“, urban industrial societies may experience increasing occupational and residential segregation. This intra-urban polarisation process is thought to be evoked by global and regional economic restructuring, particularly by an increasing importance of the service sector in large, globalised cities. So far, however, research has failed to show if such an intra-city polarisation process should be expected only in some of the most important cities of the global urban hierarchy or in any type of urban agglomeration. In order to analyse the basic causal interdependencies thought to shape current changes in the composition of the urban structure, future research needs to incorporate harmonised comparative information, which a. covers a comprehensive range of urban regions, preferably of different countries, an b. includes information both on an aggregate, neighbourhood, but also on an individual level. This paper aims at taking a first step in this direction by analysing neighbourhood stratification processes in urban regions in Germany. This research is based on (i) German regional and municipal statistics, and (ii) micro-data from the German Socio-economic panel (GSOEP).

JEL Classification: R23, O18, R11, R55

Keywords: tertiarisation, segregation, polarisation hypothesis

1. Introduction

In the urban and regional science literature, there is a long tradition of research into the determinants and characteristics of spatial differentiation and regional segregation. This has experienced a new impetus in the 1980s by a number of authors arguing that in the face of global and regional economic restructuring, urban industrial societies may experience increasing occupational and residential segregation (Friedmann 1986, Sassen 1991). Due to lack of empirical validation, this “polarisation hypothesis“ has been in the focus of a controversial discussion, which has not yet resulted in a generally accepted view of the possible interrelations between economic and urban structural change (Hamnett 1994, 1996; Burgers and Musterd 2002; Samers 2002).

Furthermore, common agreement on segregation determinants and effects is hampered by a number of remarkable differences between the composition of urban neighbourhoods in North America and Europe. Most importantly, segregation research in North America naturally focuses on the residential patterns...
of ethnic groups (Sethi and Somanathan 2004), whereas in Europe, attention so far has been paid mainly to socioeconomic disparities. In spite of comparatively lower degrees of residential segregation between ethnic groups, however, concern about migration and lack of integration of immigrants has been growing in Europe for quite some time. Recent incidents in French cities have redirected this topic to the political agenda (Economist 2005). Still, differences in the mechanisms of spatial composition must be kept in mind when trying to transfer findings from segregation research in North America to a European context. This is also true for the segregation between homeowners and renters. Hoff and Sen (2005) predict and find a considerable degree of tenure segregation in the large metropolitan areas of North America. When applying their theoretical approach to the study of segregation in Europe, some of their assumptions may have to be altered, as homeownership here is a less distinct status indicator.

In spite of the intermediate state of the academic discussion, the debate about urban polarisation has resulted in a number of new policy initiatives to upgrade the focal points of deprivation in urban areas. Yet, the theoretical argument for such measures is still rather vague, and it is very difficult to evaluate them as it is not quite clear what they can be expected to achieve. Among urban policy-makers it seems to have been accepted as “common knowledge” that cities face internal socio-spatial polarisation. Yet, there is hardly any evidence suggesting that this is a general trend affecting all cities to the same extent. RWI Essen is currently involved in a number of evaluation studies on local economic development policy in Germany (Neumann et al. 2006).

A more systematic approach to the analysis of urban change is required to define the goals and possible outcomes of district-oriented policy more clearly. Following a brief review of the current state of the literature, this paper raises a number of key issues for further study and presents some empirical results based on German regional and municipal neighbourhood statistics and on data from the German Socio-economic panel (GSOEP). In Germany, restricted access to neighbourhood statistics and lack of neighbourhood reference in microdata has imposed additional constraints on this type of research, compared to the U.K. and the U.S., where considerable progress in examining the role of neighbourhood effects has been achieved.

2. The state of the discussion about processes currently shaping the urban structure

In the regional economic, geography and sociology literature, there is a long tradition of research into the structural determinants of residential segregation, dating back at least to the very influential 1920s work of the Chicago School of Sociology. This type of analysis is usually based on small area aggregates, i.e. census wards or other intra-city statistical sub-districts. In the course of the 20th century, methods of intra-city analysis were systematised and standardised. This research has shown that in urban-industrialised societies, urban areas typically differentiate into a number of quite homogeneous sub-zones. These “natural
areas” (Zorbaugh 1926) differ greatly in their socio-economic, demographic and ethnic composition.

While the regional sciences literature has focused on the observation of regional and urban change, a particular branch of the econometrics literature has been concerned with neighbourhood effects, i.e. influences of the socioeconomic or ethnic composition of the residential neighbourhood on individual performance. In the neighbourhood effects literature, neighbourhood-individual relations have proven to be a rather fuzzy object to study. Here, work is only beginning to overcome the identification problems arising for neighbourhood effects models. Apart from a study carried out by Kling et al. (2005), who analyse the effects of the Moving to Opportunity programme in five U.S. cities under quasi-experimental conditions, research into neighbourhood effects usually faces the limits of any non-experimental approach. As Durlauf (2004, 58-62) argues, there are serious limitations even to the evidence provided by the research of Kling et al. Most importantly, it is still impossible to determine exactly what aspects of the different neighbourhoods (e.g. housing quality or more general neighbourhood characteristics) led to observed outcomes.

In a comparative study of post-industrial economic change and its effects on the two largest Dutch cities, Burgers and Musterd (2002) find that the polarisation model seems to be more powerful in explaining inequality in the more tertiarised Amsterdam labour market while the mismatch scheme seems to be more adequate for Rotterdam. Unemployment of ethnic minority groups is lower in Amsterdam than in Rotterdam because job opportunities for them are better in the more advanced post-industrial Amsterdam urban economy. In the view of Burgers and Musterd, the specific historical economic trajectories of both cities give rise to substantial differences in the local outcomes of economic change and in the character of inequality.

Klagge (1998) points out that in West Germany urban settlements with over 50,000 inhabitants score considerably higher shares of poverty – as displayed by the numbers and shares of welfare receivers – than rural areas. However, between 1970 and 1993, there was no above-average increase in the share of welfare receivers in cities. In Germany, poverty is primarily an urban phenomenon and overall poverty rates are increasing. Yet, they are increasing in general and there is – at least as this poverty indicator is concerned - no widening of the gap between urban and rural areas. However, the indicators chosen here might not be sufficient to represent current changes affecting social cohesion in urban areas. According to Klagge’s results there seems to be a positive correlation between the degree of tertiarisation, i.e. the share of employees in the service sector, and the share of benefit receivers in a city. This may be an argument for polarisation. Yet, as Klagge emphasises, corroboration of this theory depends on a more differentiated measurement of the tertiarisation process.
3. Empirical evidence from urban regions in Germany

3.1 Is there an effect of tertiarisation on intra-city differentials in the Rhine-Ruhr metropolitan region? An analysis based on municipal and regional statistics

The following analysis is based on a sub-city data set compiled by municipal statistics in Germany. In Germany, administrative sub-city statistics is assembled and published by the municipal statistical offices. Due to municipal statistical autonomy, there is no obligatory standard concerning indicators or size of districts. In spite of these difficulties, over 100 cities (almost all with more than 100,000 inhabitants) have agreed to distribute a limited set of sub-city data. The current indicator set comprises the following variables: population at primary residence, female population, foreigners, age groups (under 18, 18-29, steps in tens up to 59, 60 and over), residential population altogether (primary and secondary residence), number of households.

The Rhine-Ruhr metropolitan region (11 Million inhabitants) is the largest urban agglomeration in Germany. It is particularly suitable as a case study, as the survey area covered by the municipal data base here represents 60% (6.7 Million inhabitants) of the overall population of this polycentric urban region. In this analysis, by adding information from Statistics North Rhine-Westphalia (LDS NRW) a data base comprising the whole of the inner and outer zone of the region (Figure 1) was compiled. It comprises data on over 900 sub-city statistical districts.

Polarisation within the urban system divides the largest German agglomeration into two subregions representing bipolar positions concerning progress in urban change: the northern part of the agglomeration, the Ruhr region (i.e. the area from Duisburg eastwards), was once dominated by the coal, iron and steel industries and still resides in the middle of structural change. The southern part of the agglomeration represents a much more dynamic (and tertiarised) group of cities: in the Ruhr subregion 69% of all employees work in the service sector, in Düsseldorf and Cologne 80%, in Bonn 87%.

For a more plausible measurement and as a prerequisite of a subsequent spatial classification, the original data set was reduced to independent dimensions by factor analysis. In spite of a number of distinctive regional features, segregation patterns observed in this region appear to reflect a number of basic neighbourhood stratification mechanisms identified by previous research in other regions (Knox 1995, 50). Three dimensions (two demographic dimensions and one ethnic/socioeconomic factor) represent most of the differentiation observable by the original indicators.

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1 at 30.06.2005
2 record date: 31.12.2000
In a subsequent analysis of the effects of urban economic restructuring on the heterogeneity between neighbourhoods it was found that in the Rhine-Ruhr region demographic segregation increases parallel to the tertiarisation of cities (Table 1). By regression analysis, the effects of the local labour market structure and change on intra-city differentials between neighbourhoods were estimated. No final solution to the identification problem concerning the supposed segregation effects of labour market change was provided by this approach. Yet, it was examined if the observation of intra-regional differentiation at least will not falsify the basic assumptions of the polarisation hypothesis.

The above-mentioned factor analytic dimensions served as indicators of intra-urban heterogeneity. Estimated were the effects of the present degree of labour market tertiarisation\(^3\), past change in the degree of labour market tertiarisation\(^4\) and further structural indicators (unemployment, qualification of local work

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\(^3\) share of employees (at workplace location) in the service sector in 2002

\(^4\) change of share of service sector employees 1970 - 2002
force, share of foreigners, age structure) on the variation of the factor analytic segregation dimensions in \( i = 1, \ldots, 943 \) sub-districts of 23 municipal territories. The intra-city variation\(^5\) of the factor values served as measure of the degree of segregation between neighbourhoods within a city. The share of (high qualified) employees working in the finance sector served as an alternative measure of the degree of tertiarisation in a comparative analysis, as the finance sector is known to be one of the driving forces of economic internationalisation and globalisation (Dicken 2003). According to the polarisation hypothesis, particular regional importance of this sector would therefore be expected to combine with a high degree of intra-city segregation. It can be assumed that there emerges no endogeneity problem in this empirical framework, as there is no reason to suggest that the segregation dimensions, which were measured on a sub-city district level, incorporate an effect of the overall structural positioning of the city.

The results corroborate one assumption of the polarisation hypothesis, as they show an effect of tertiarisation on the segregation between different types of household (e.g. singles, families with children) (Factors 1 and 3) and socioeconomic groups (Factor 2) (Tables 1 and 2). Yet, there is a higher influence of labour market characteristics on the demographic (Factors 1 and 3) than on the socioeconomic structure (Factor 2). As expected, higher unemployment combines with higher segregation between socioeconomic groups. However, change in the degree of tertiarisation among cities of the Rhine-Ruhr metropolitan region obviously exerts a negative effect on the degree of intra-city segregation, i.e. an increasing importance of the service sector between 1970 and 2002 combines with a lower degree of segregation. Thus, at least as far as cities in this region are concerned, there is no evidence for a causal relation between increasing tertiarisation and intra-city polarisation.

Demographic segregation of the more tertiarised cities here is not an effect of the economic restructuring processes the region has passed through since the 1970s. In fact, it is a result of the long-term intra-regional differentiation between the “old industrial” northern Ruhr area on the one hand and the more tertiarised southern Ruhr area and Rhinefront region around Dusseldorf, Cologne and Bonn on the other.

In general, differentiation between cities is known to be rather persistent over time (Neumann 2002). The existing evidence suggests that in the Rhine-Ruhr agglomeration this is also quite true for intra-city differentials, i.e. the sorting mechanism behind neighbourhood formation.

The same results are given by an alternative analysis of the effects of the importance (and change of importance since 1970) of the finance sector within the local labour market. As expected, the presence of the finance sector exerts a stronger influence on intra-city differentiation than that of the service sector in general (compare tables 1 and 2). Yet, an increasing share of finance sector employees again combines with a decreasing degree of segregation.

\(^5\) standard deviation
\(^6\) share of employees (at workplace) in the finance sector in 2002
Table 1
Estimation results for the intra-urban heterogeneity of the Rhine-Ruhr metropolitan region (a)

<table>
<thead>
<tr>
<th>independent variable</th>
<th>$sF_1$</th>
<th>$sF_2$</th>
<th>$sF_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>tertiariaisation</td>
<td>0.51</td>
<td>18.4</td>
<td>0.29</td>
</tr>
<tr>
<td>Δtertiariaisation</td>
<td>-0.31</td>
<td>-11.2</td>
<td>-0.36</td>
</tr>
<tr>
<td>unemployment</td>
<td>-0.14</td>
<td>-7.4</td>
<td>0.45</td>
</tr>
<tr>
<td>foreigners</td>
<td>0.19</td>
<td>7.4</td>
<td>-0.01</td>
</tr>
<tr>
<td>under 18 yrs old</td>
<td>0.02</td>
<td>0.8</td>
<td>0.03</td>
</tr>
</tbody>
</table>

adjusted R²            | 0.37   | 0.29   | 0.42   |

F                     | 111.0  | 78.2   | 137.2  |

observations          | 943    | 943    | 943    |

Author’s calculations based on Data from AG KOSTAT (2000) and Statistics North Rhine-Westphalia (LDS NRW), italic values significant at 0.01-level

Table 2
Estimation results for the intra-urban heterogeneity of the Rhine-Ruhr metropolitan region (b)

<table>
<thead>
<tr>
<th>independent variable</th>
<th>$sF_1$</th>
<th>$sF_2$</th>
<th>$sF_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>finance sector</td>
<td>0.68</td>
<td>18.4</td>
<td>0.29</td>
</tr>
<tr>
<td>Δ finance sector</td>
<td>-0.31</td>
<td>-11.2</td>
<td>-0.36</td>
</tr>
<tr>
<td>unemployment</td>
<td>-0.19</td>
<td>-8.8</td>
<td>0.42</td>
</tr>
<tr>
<td>foreigners</td>
<td>0.10</td>
<td>4.6</td>
<td>-0.05</td>
</tr>
<tr>
<td>under 18 yrs old</td>
<td>0.03</td>
<td>1.3</td>
<td>0.04</td>
</tr>
</tbody>
</table>

adjusted R²            | 0.37   | 0.29   | 0.42   |

F                     | 111.0  | 78.2   | 137.2  |

observations          | 943    | 943    | 943    |

Author’s calculations based on Data from AG KOSTAT (2000) and Statistics North Rhine-Westphalia (LDS NRW), italic values significant at 0.01-level

1 OLS regression, $sF_1$, $sF_2$, $sF_3$ = intra-city variation (standard deviation) of factor values (factors 1-3)
2 partial regression coefficient of standardised variables
3 partial regression coefficient of standardised variables
4 Share of employees in the finance sector
3.2 Is polarisation evident between urban neighbourhoods in Germany in general? An analysis based on the German Socio-Economic Panel

If polarisation between neighbourhoods is evident, this must be the effect of some kind of recently enhanced filtering or sorting mechanism inducing households to migrate. In the near future, it will be possible to add neighbourhood information to microdata from the German Socio-Economic Panel (GSOEP) and thereby to build up an empirical base for Germany comparative to the UK data analysed by Bolster et al. (2004). The SOEP was started in 1984 as a longitudinal survey of private households and persons in the Federal Republic of Germany. In 1990, the SOEP sample was expanded to Eastern Germany. The central aim of this panel study is to collect representative micro-data on persons, households and families in order to measure stability and change in living conditions\(^\text{11}\).

So far, neighbourhood classification in the GSOEP depends on information given by the respondents themselves. Among the GSOEP respondents, only those reporting to live in a city with 20,000 or more inhabitants have been included in this analysis. This size limit roughly corresponds with the size of the smallest towns in the suburban zone of the Rhine-Ruhr metropolitan region. For a first explorative analysis of neighbourhood formation, the GSOEP classification appears to be sufficient as a rudimentary measure of the neighbourhood type. Yet, as explained before, linkage of GSOEP microdata with small area statistics may improve the scope of neighbourhood-oriented analysis in the near future. In the following, we distinguish between four types of GSOEP neighbourhood:

1. mixed residential/commercial area,
2. urban/suburban residential areas with mainly pre-war housing stock,
3. urban/suburban residential areas with mainly post-war housing stock
4. 1-and 2-family-homes in urban/suburban residential areas

As explained, future regionalisation will improve the suitability of the GSOEP for regional analysis. Still, the GSOEP neighbourhood types roughly correspond with the analytical types of the Rhine-Ruhr agglomeration. For the time being, differentiation among the demographic and socioeconomic structure of the four-neighbourhood GSOEP typology defined above is sufficient to reflect some major aspects of residential segregation in Germany. This small area information contained in the GSOEP therefore qualifies as a base for segregation analysis. To assess some of the basic arguments of the polarisation hypothesis, this research focuses on the individual and neighbourhood-related determinants of migration decisions which lead to segregation and on possible changes among these determinants over time. The results of this econometric analysis will be published in a forthcoming report (Neumann 2006). This paper gives a first review of differentiation between the GSOEP neighbourhood types and its change over time.

\(^{11}\) Internet: www.diw.de/english/sop/index.html
Over the study period, there has been some variation yet no considerable change in mobility (Figure 2). In the 1990s, mobility increased somewhat in quarter types 1-3, yet at the end of the decade there was again a decrease back to a level which is only slightly higher than that of the mid-1980s. In general, comparatively low mobility separates the most “suburban” neighbourhood type 4 from the more “urban” types 1-3. Not surprisingly, households living in a 1- or 2-family home tend to stay at their choice of location longer than those living in a larger housing unit. Quite surprisingly though, the GSOEP data suggest no considerable difference in mobility between mixed residential/commercial type 1 and the residential quarters of types 2 and 3. In general, below-average mobility or, in other words, a rather high stability of neighbourhood composition seems to be a characteristic of suburban districts, in which 1- or 2-family homes prevail. On the other hand, large city neighbourhoods in general show a considerably higher degree of fluctuation. Over time, this urban-suburban dichotomy has remained remarkably stable.

A more distinct stratification predominates the perception of neighbourhood surroundings. Concerning the share of households reporting to have improved their neighbourhood by relocation in the previous year, a ranking has been established, in which type 4 usually scores an above-average share of “improvers”. In general, over half (most of the time about two thirds) of all households choosing type 4 as target location report to have improved their neighbourhood surroundings. In the other quarters, only about half (type 3) or considerably less than half of all in-movers (types 1 and 2) report to have improved their location. Obviously, moving to a 1-2-family home combines with particularly high satisfaction concerning neighbourhood surroundings.

Among type 4-dwellers, higher contentment with neighbourhood choice combines with comparative affluence (Figure 3). Since 1985, the share of residents living in households, which belong to the top quartile of household income of each respective year, has been considerably higher in quarter 4 than in the other quarter types, remaining at way over 25%. This gap has been stable, with quarter 1 (mixed commercial/residential area) staying at second position over most of the study period, in some years swapping ranks with type 3 (post-war residential area). Affluent households obviously tend to prefer either suburban/rural areas or central city mixed commercial/residential quarters as their choice of location.

Usually under 50% of high earner households moving to central city areas report to have improved their neighbourhood location. Thus, many of them move to the city centre in spite of rating it as a quite unfavourable neighbourhood location, i.e. their choice of residential area is dominated by other factors than the desire to live in a “good” neighbourhood. Definitely, from their point of view, quarters 2 and 3 only offer the least attractive alternative residential location.
Figure 2
Mobility in GSOEP neighbourhood types of West German cities
Residents who changed their residential location, by neighbourhood type of target location
\[
\begin{array}{cccc}
1 & 10 & 12 & 14 & 16 \\
2 & 8 & 10 & 12 & 14 \\
3 & 6 & 8 & 10 & 12 \\
4 & 4 & 6 & 8 & 10 \\
all & 20 & 22 & 24 & 26
\end{array}
\]
\*cities with over 20,000 inhabitants
Source: GSOEP Waves A and B, Author’s calculations

Figure 3
Income distribution among GSOEP neighbourhoods of West German cities
Residents in respective year’s top quartile of net equivalent household income
\[
\begin{array}{cccc}
1 & 30 & 32 & 34 & 36 \\
2 & 25 & 27 & 29 & 31 \\
3 & 20 & 22 & 24 & 26 \\
4 & 15 & 17 & 19 & 21 \\
\end{array}
\]
\*cities with over 20,000 inhabitants
OECD scale (weights: household head = 1, household member over 16 = 0.5, under 16 = 0.3)
Source: GSOEP Waves A and B, Author’s calculations
Research in the Rhine-Ruhr metropolitan region has revealed that the lifestyle-oriented choice of location of the economically active younger adults (roughly 30-40 years of age), who have proven to prefer either the city centre or the urban fringe, is one of the main driving forces shaping the demographic and socioeconomic structure of urban neighbourhoods today. While residential areas dominated by one-family homes probably represent the idea of a “good” neighbourhood for the majority of them, some sacrifice living in “good” surroundings for an “urban” life.

In general, a relatively stable gap distinguishes households residing in 1- and 2-family homes from other households by

- lower mobility,
- higher contentment with residential location, and
- higher income.

4. Conclusions and issues

It was the aim of this paper to examine some of the assumptions of the polarisation hypothesis, according to which labour market changes are supposed to be interlinked with regional segregation.

Analysis of municipal statistics and GSOEP microdata reveals that

- there is a very strong dichotomy between more central urban areas and suburban zones concerning age, family status, and income,
- the desire of relatively well-off families to live in a 1- or 2-family-home has been one of the main driving forces of segregation since the 1980s,
- according to a first, neighbourhood-level review of the German Socio-Economic Panel, there have been no major shifts in intra-urban mobility or in the intra-urban distribution of different socioeconomic groups since the 1980s, and
- particularly, a hypothesis suggesting that progress in the tertiarisation of urban labour markets has combined with intra-city residential polarisation cannot be confirmed.

The empirical framework employed here is by no means sufficient to provide a comprehensive evaluation of the determinants of regional segregation. Replacement of self-reported neighbourhood characteristics by classifications based on regional and small area statistics may improve the evidentiary standards of this approach in the future.

These results of this paper relativise the polarisation assumptions with regard to segregation processes in urban regions in Germany. Yet, even if no dramatic newly-inflicted occupation-based spatial segregation processes can be observed, segregation is part of urban life in industrial societies and there may be adverse effects of segregation on individual and regional performance. To date, evidence
for these effects is vague and existing studies come to somewhat ambiguous conclusions. A history of urban riots dating back to the 1960s in the USA clearly suggests that unbalanced neighbourhood structures may inflict a variety of detrimental effects on individuals and regions.

The public debate about the origins and political implications of recent incidents in French cities has revealed that perplexity concerning the determinants and effects of urban segregation persists. In the Rhine-Ruhr agglomeration, there is an interrelation between the overall economic positioning and the type and degree of differentiation between the sub-districts of urban areas. Yet, this pattern of intra-city segregation has evolved over quite a long period of time and proves to be very consistent.

This rather sceptical assessment of the polarisation argument is not to be interpreted as a negation of segregation or as a negative review of the existing approaches to revitalise urban areas. It is a call to invest further effort into the analysis of the determinants, mechanisms and effects of segregation in order to come to results from which helpful advice to urban policy may be derived.

References


