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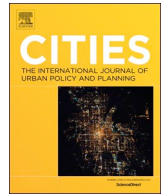
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Factors driving the regrowth of European cities and the role of local and contextual impacts: A contrasting analysis of regrowing and shrinking cities

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ABSTRACT

This paper undertakes a comparison of two regrowing and two shrinking European cities in order to identify the factors driving demographic regrowth and economic recovery of cities and how and why those factors are at work in some cities that turned from population decline towards new growth while others did not. Our objectives are to systematically elaborate the factors that are influencing urban regrowth, explain how these factors interact and are mutually dependent and to discuss how these factors relate to contextual conditions at different scales. For our contrasting analysis, we selected Liverpool and Leipzig, two cities that have seen regrowth after shrinkage and Łódź and Ostrava, two cities that continue to shrink. As a result of this comparison, we identify general local and contextual factors driving regrowth and discuss their interaction and what we learn from this for the wider urbanisation debate.

1. Introduction

While many cities across Europe experienced continuous population growth throughout the 20th Century and beyond, others, notably in former industrial areas, began to experience population decline as their industrial base eroded. However, since the millennium and especially after 2010, some of these ‘shrinking’ cities have returned to growth. The question is why have some of these cities returned to growth while others continue to decline? There are many factors that affect the dynamics of cities and in recent years there has been a growing body of research on both shrinkage and regrowth. But how do they relate to each other? Which factors and contextual conditions determine that some cities are seeing new growth after shrinkage while others do not? How do these factors and conditions interact? Why do some cities recover both in terms of population and economy while others continue to lose population despite economic recovery?

Thus our research questions, with respect to our cases, are as follows:

What factors allowed some cities to turn from shrinkage towards

demographic regrowth and economic recovery, while others are shrinking further?

To what extent is regrowth driven by the national and regional context?

What do we learn from a comparative and contrasting analysis for the general debate?

To these ends, we have compared the experiences of two regrowing cities with those of two cities that are continuing to experience shrinkage. All four cities show more or less clear signs of economic recovery or even growth but two are regrowing in terms of population [Leipzig in Germany and Liverpool in the UK] while two are continuing to lose population [Łódź in Poland and Ostrava in Czechia]. Through such a contrasting comparison, we have been able to identify factors and contextual conditions that drive regrowth and to understand how their interplay impacts upon different sectors of urban development.

Our paper is structured as follows. After this introduction, we provide a summary of the current stage of knowledge on regrowth and the debate on what makes cities turn from shrinkage towards regrowth. Next we explain how our questions have been operationalised into a

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contrasting comparison of four cities. The four case analyses are then presented. In the discussion, we return to our research questions and provide a cross-case-based heuristics of how regrowth and its driving factors and their interplay may be understood. We also reflect on the general debate on urbanisation and especially on different trajectories of population and economic development and their interaction and contingency.

2. Debates on urban regrowth – what we know and what we have to research

Urban regrowth and shrinkage can be looked at as two stages within the urbanisation cycle. In urban life cycle models (Klaassen & Scimeni, 1981; Van den Berg et al., 1982), shrinkage is represented by the second phase, suburbanisation, when the core city loses population and the hinterland grows and the third phase, disurbanisation, when both core city and hinterland lose population. Regrowth, or reurbanisation as it was called by Berg et al., was introduced as a fourth stage of the urban cycle. Reurbanisation was treated as a hypothetical stage since most cities were characterised mainly by suburbanisation at that time, and would be reached when the core city, in contrast to its hinterland, showed relative or even absolute population regrowth. In this heuristic model, however, nothing was said about which factors and contexts lead to further shrinkage or promoted reurbanisation.

2.1. Urban shrinkage debate

The *urban shrinkage* discourse includes a large body of work that has addressed the issue in other contexts and using other terms such as decline, decay, blight etc. The shrinkage discourse has become more robust in recent years, increasingly addressing critical questions of conceptualisation, measurement, the interaction of shrinkage with other urban development dynamics and how urban shrinkage is perceived (Wolff & Wiechmann, 2017; Haase et al., 2014; Grossmann et al., 2013). Scholars have extensively addressed:

- i) i). the identification of causes and effects of losses and decline (Hill et al., 2012; Reckien & Martinez-Fernandez, 2011; Wiechmann & Pallagst, 2012); some studies also combine the analysis of causes and conditions with an exploration of possible interconnections between them, see e.g. Newman et al., 2018);
- ii) ii). describing and classifying trajectories of shrinking cities (Mykhnenko & Turok, 2008; Turok & Mykhnenko, 2007; Wolff & Wiechmann, 2017);
- iii) iii). discussing planning responses and adaptation strategies (Schilling & Mallach, 2012; Dewar & Thomas, 2013; Jessen, 2012; Hospers & Reverda, 2012; Haase et al., 2014; Special Issue of European Planning Studies 2015 vol. 23,1, and the rightsizing debate, see e.g. Hollander & Németh, 2011).

Research on shrinking cities has been strongly case-study-based. There has been little work that tries to conceptually grasp shrinkage. Haase et al. (2014, 1524) identified a gap between macro-theoretical conceptualisations and empirical observations on a micro-level and pleaded for more research at the meso-level. Bernt (2015, 1) points to methodological pitfalls in the conceptual debate on shrinkage and suggests that population losses in cities should be conceptualised in a broader historical context, inviting the scholarly community to think about “insufficient understanding of cities as historical processes” as well as the “absence of attention to scalar interrelations”. Grossmann et al. (2013) underline the need to pursue more extensive comparisons of shrinking cities in cross-national and policy/governance contexts, in order to uncover underlying themes and dynamics and to foster cross-contextual learning.

2.2. The debate on urban regrowth

When turning the focus from shrinkage towards *regrowth*, we see that new growth after shrinkage is not a new issue. The idea of a revival of inner or core cities, set against a context of former decline, was discussed in the 1960s and 1970s by urbanists or urban planners in many countries. The debate considered reurbanisation not just as a return to the city but as qualitative change including new urban forms, mixed use areas and the idea of urban conservation. The period also saw extensive work on urban regeneration and gentrification.

Different terminologies have been used for the phenomenon, including: reurbanisation, resurgence, revival etc. Regrowth has also been addressed in different contexts or lines of thought. Apart from the urban life cycle models, another strand of discussion that has some anchor points in cyclic models deals with the reconcentration of population in large cities, set against an overall regional context of shrinkage: core cities as ‘islands of growth or stabilization’ (Herfert, 2007) or as winners in a continuous context of decline (Couch et al., 2009). According to these studies, large cities either remain as the only places without decline, or recover first, or become destinations for inward migration because of their amenities and infrastructures (Rink et al., 2012).

Other scholarly work looks at reurbanisation in relation to demographic, household, or housing change (e.g. Buzar et al., 2007; Haase et al., 2010; Karsten, 2014; Mulder & Dieleman, 2002; Wolff et al., 2016) or the nature of inner-city revival in the context of urban renaissance policy or neoliberal urban development (Cheshire, 2006; Stead & Hoppenbrouwer, 2004, Colomb, 2007, Helbrecht, 1996, Storper & Manville, 2006). Generally, the debate on “resurgent cities” (Cheshire, 2006) and the impacts of population growth on different ‘arenas’ of urban development is fuzzy and thus far, systematisations (e.g. Brake & Urbanczyk, 2012; disP thematic issue, 2010; Haase et al., 2005) have merely compiled a variety of connotations and contexts that relate to regrowth or reurbanisation.

2.3. Factors driving regrowth

When we look at the factors which are identified by recent studies as being important in supporting population regrowth, we find different approaches. Based on a comparative study of various “Phoenix cities”, Power et al. (2010) and Power and Katz (2016) see the following factors as crucial: land reclamation and environmental upgrading; sprawl containment; improvement in transport infrastructure; physical redesign and restoration; neighbourhood renewal; creation of jobs; building new skills in the population; civic leadership and increased participation; social inclusion; and new publicly sponsored agencies that help to deliver change.

In another comparative work on the “remaking of postindustrial cities” Carter (2016) conclude that regrowth should be understood as a stepwise process that takes time. The most important supporting factors for such a process they see in: the consideration of the metropolitan (not the urban) scale; the need for a long-term vision; the development of a sustainable planning strategy; the need for alliances and partnerships, strong leadership and citizen engagement; diversification of the economy; a strengthening of the central city; investment in education, culture, quality of life, heritage and urban design; and a readiness to take risks.

Interestingly, a key factor that is not mentioned in either study, yet is central to regrowth, concerns active population policy and provision to attract and retain the young households, families and early-stage professionals, who are typically in the vanguard of reurbanisation. Both studies say something about the interaction of factors but little about what prioritisation, ordering or combination of factors might best influence the turn from shrinkage towards regrowth.

Rink et al. (2012) highlight existing ambivalences of regrowth and discuss related risks for a sustained new growth after shrinkage. Particularly, they mention the economic fragility and continuous

dependency of regrowing cities on external decisions (e.g. by large-scale investors and the political choices of national or regional governments) and on external factors such as national or regional economic circumstances, points also emphasised by Dembski et al. (2019). Further, on the demographic side, Rink et al. suggest that the in-migration trends that have been a key factor in much observed regrowth can change quickly, making them, unlike natural population change, difficult to build into long-term population projections. They also underline the ambivalence of those success factors that were identified at the moment of research: what today may support regrowth, may tomorrow lead to new problems and hinder regrowth.

Existing studies on urban regrowth (see Power et al., 2010, Power & Katz, 2016, Carter, 2016; Rink et al., 2012 thus refer to regrowing cities only and do not contrast them with shrinking cities. Here, our study goes one step further by contrasting the experiences of regrowing and shrinking cities. We seek to build a comprehensive perspective that draws on a heuristic approach that tries to understand the factors influencing regrowth.

We might conclude that several factors are responsible for regrowth but it is not just their presence or absence that is the key determinant. Much more important are: i) their interplay and contingency; ii) the combinations in which they are present or absent; and iii) the impacts of contextual conditions on those factors. This is the focus of our study.

In our analysis we distinguish between factors and contextual conditions. Factors are either processes or policies and developments produced by them and relate to various sectors of urban development such as population development, job creation, investment development, housing renovation and construction, development of the education and medical sectors etc. Contextual conditions are, on the one hand, those conditions that impact on local scale development but operate at an upper level (regional, national, EU, global). On the other hand, conditions may be settled also at the local scale and relate to agency, attitudes & values, decision-making, leadership and governance, co-operation and networking etc.

3. Operationalisation and contrasting comparison

The paper uses a contrasting relational comparison as the most promising method of uncovering relationships between factors beyond general cause-effect constellations (Wolff & Haase, 2019; Ward, 2009). We use a two-step approach in which we contrast two types of cities: cities that have experienced economic recovery and population regrowth; and cities that are experiencing economic recovery but continued population shrinkage.

First, and in line with previous studies, population development is used in the selection of case studies and to detect periods of shrinkage and regrowth. Regrowth is understood as the significant increase of population in cities after a long phase of decline. Shrinkage is understood as a considerable population decline over a long period. In order to ensure comparability with other scholarly work dealing with urbanisation pathways, population development was used as an easily accessible and frequently used indicator that represents a multifaceted process and allows conclusions about adjacent processes such as household change (Beauregard, 2009; Turok & Mykhnenko, 2008). Decisive for our definition of regrowth clearly distinguishing it from simple 'growth' (Cheshire, 2006: 1232) is that it is preceded by a longer phase of shrinkage. This means that regrowth has to be interpreted within the context of previous shrinkage. Regrowth may occur against a background of growing, stable, or declining population development in the city's hinterland.

As regrowth and shrinkage are complex issues which cannot be reduced to a single indicator, a second step uses additional data including economic development, economy and planning strategies, the role of external funding etc. in order to analytically discuss regrowth in a wider perspective. The contrasting comparison allows us not just to analyse factors of regrowth and their interaction. Rather, we are able to

assign the role of different factors and the combination of factor-bundles for stimulating both population and economic growth (Wolff & Haase, 2019). Therefore, the case studies focus on those developments and policies that help to explain the presence or absence of population and economic regrowth. Subsequently, we address the role of population development as an indicator for urbanisation processes in the discussion.

A further reason why shrinking cities research is strongly case-study based is that spatial definitions and typologies of space differ across cities. Keeping all variables consistent in ontology is nearly impossible. This is also true for our cross-case comparison. Generally, any cross-case comparison faces this challenge and represents, in a way, a compromise (see Wolff & Haase, 2019). The cities have been chosen based on population trends as described above, political context, and expert knowledge according to what scholars called the 'comparative gesture' (Robinson, 2011; see also Pickvance, 1986; Kantor & Savitch, 2005; McFarlane, 2010). Consequently, the selected cases do not represent a strictly systematically selected and controlled sample but serve as a base for detecting our research questions being aware of all the issues that delimit a rigorous comparison (e.g. lack of generally applicable theoretical models, the impossibility of displaying larger sample of cases for a comprehensive pattern detection, the crucial importance of cultural, or institutional factors). The case studies have been selected using a number of criteria. We selected second-ranked cities as being more typical of Europe's large cities landscape, more than the first-ranked capital cities. Leipzig and Liverpool represent cities that made the turn from shrinkage towards regrowth, acknowledging in this selection the fact that regrowth has become an established subject of scholarly debate in Germany and the UK. Lodz and Ostrava were selected as shrinking cities in post-socialist countries where, even today, there remain many continuously shrinking cities. By contrasting the political context, we seek to detect the impact of different, nationally to locally-based policies, programs and regulations influencing urban regrowth. We further applied criteria which are concentrated on population trajectory (same regrowth rate for Leipzig and Liverpool) so as to expose the explanatory power of other criteria e.g. economic aspects (incorporating contrasting criteria and expressions, see Wolff & Haase, 2019).

4. Case analyses

4.1. Leipzig

Being an important hub of industrialisation, trade fairs, education and culture, Leipzig reached the status of a big city (> 100,000 inhabitants) before 1871 and reached its population peak in 1931. Leipzig was one of the fastest growing cities in Europe and the fifth largest city in Germany before the Second World War. After 1945, the population steadily decreased but dropped dramatically after re-unification (Table 1). This loss was caused by deindustrialisation-driven out-migration, falling fertility rates and suburbanisation. The effects of urban

Table 1
Population, migration balance and natural balance for Leipzig.
Source: Statistical Office Leipzig.

Year	Population	Migration balance	Natural balance
1990	511,079	-16,403	-2064
1995	471,409	-7167	-3580
2000	493,208	1012	-1676
2005	502,651	5353	-1218
2010	508,775	4359	-374
2012	528,540	10,817	-115
2015	567,846	15,552	423
2016	588,621	13,193	160
2018	596,517	6974	304

shrinkage accelerated the amount of brownfields and vacant flats. Leipzig already had a vacancy rate of 10% in 1990, mainly due to inadequate maintenance of property during the period of state socialism. In the 1990s this vacancy rate increased to extreme levels as the population shrank and housing supply increased. At the peak, in 2000, more than 60,000 flats were empty: approximately 20% of the total housing stock (Rink et al., 2012). As the situation stabilized during the 2000s, with rising demand and selective demolition, the vacancy rate fell to 12.1% in 2011 and with even more dynamic regrowth after 2010 the vacancy rate reached a low of 4.5% in 2018. Although there were brownfield sites in Leipzig prior to 1990, rapid deindustrialisation, demilitarisation and population shrinkage in the following decade saw the emergence of around 2000 brownfield sites covering about 900 ha by 2000. In the course of the subsequent urban restructuring many brownfield sites were converted into green spaces and pocket parks or transformed into interim uses.

To counteract the 1990s shrinkage crisis, the federal government made massive public investments in transport, technical and social infrastructures, housing, higher education, the labour market and ecological revitalisation, and subsidised private investment in industries and services. At the beginning of the 2000s, first signs of an economic upswing became visible, with new plants built by BMW and Porsche, partly supported by public money. The city experienced expansion in higher education, a biosciences park was established, and existing science parks were enlarged. The city started to regrow slowly (0.5–1% annually) due to (mostly young) in-migration, which became visible in the inner city, in the form of reurbanisation (Fig. 1). From 2002/2003 onwards, a bipolar picture emerged: a (re)growing city, together with shrinking surroundings. This bipolarity was fostered by in-migration from the city-region and elsewhere in eastern Germany. The above-mentioned development in the suburbanisation era began to reverse (Nuissl & Rink, 2005). After 2011, population growth became more dynamic with more than 10,000 immigrants per year. In addition, especially in 2015, the city experienced a substantial influx of refugees (Table 1).

Reindustrialisation and new economic growth created more than 70,000 new jobs between 2005 and 2017 (Fig. 2), raising employment and decreasing rates of unemployment (Fig. 3). This economic upswing largely depended on public interventions such as subsidies, grants, and direct investments. In the 2010s, after years of stagnation and demolitions, new (upmarket) housing was built; currently (2019), some larger neighbourhoods are being constructed, to provide housing for the large number of newcomers. Since 2010 much of the brownfield land has been reused for housing and infrastructure, resulting in a halving of the amount of brownfield sites remaining. Today, Leipzig is among the

fastest growing cities in Germany (approx. 2% p.a., similar to Munich or Berlin), employment rates have increased considerably, and the city offers high liveability at a relatively low cost.

Why did Leipzig make the turn? There are several factors that together have led to regrowth after around 2000:

- direct and indirect public support for new large-scale economic investment and job creation (e.g. BMW, Amazon, Porsche, DHL);
- massive public investment (from the national government, federal state of Saxony and EU) in transport and technical infrastructures (including motorways and airport), education, culture and public space;
- massive subsidies for the renovation of housing in the core city; availability of moderately priced and attractive housing;
- ecological restoration (air, water, brownfield sites);
- improvement of Leipzig's image as a highly liveable city with moderate housing and living costs and space for experiments and innovation.

What type of factors have driven regrowth? How do they operate together? Decisive for Leipzig's regrowth were massive public investments based on state, federal state or EU funding, thus, an external factor. New business that settled in and around Leipzig after 2000 benefited from the improved infrastructure (indirect effects). Population regrowth has been based mainly on positive migration balances but since 2014 the city has also seen (modest) positive natural growth. Additionally, the city built capacity in (national and international) fund raising. Since the beginning of the 2000s, the inner city has been strengthened with integrated master plans and the establishment of a green belt has helped limit suburbanisation.

Locally-based job creation coincided with a national trend of decrease in unemployment rates that resulted in rates for Leipzig that 2016 being less than a half the level experienced in the early 2000s, although many of the newly-created jobs are low-paid and precarious. Nevertheless, Leipzig's economic growth remains fragile and dependent on non-local investment and external support.

What was the (national) context that favoured or encouraged re-growth? As early as the 1990s, the Federal Government launched numerous funding programmes and sectoral policies to support East Germany in a wide variety of areas and fields. Many of these programs and policies acted against urban shrinkage. This classic growth policy led to private investment in industry, commerce and services, particularly in the 2000s. The end of subsidies for owner-occupied housing and the national target to reduce land consumption slowed suburbanisation and directed investment into the inner city. Germany was not particularly

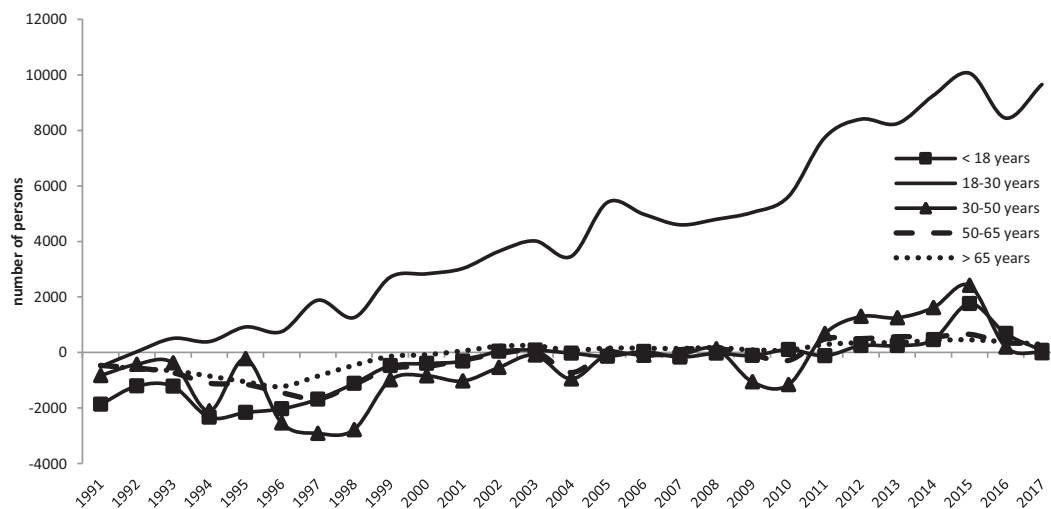


Fig. 1. Migration balance per age groups 1991–2017.

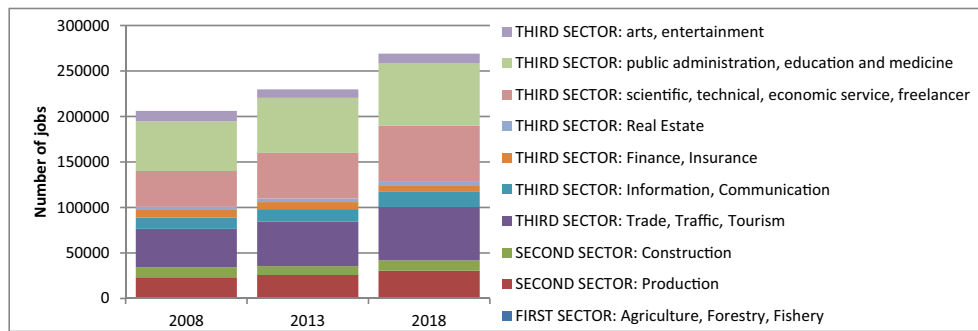


Fig. 2. Number of jobs due to sectors 2008, 2013 and 2018.

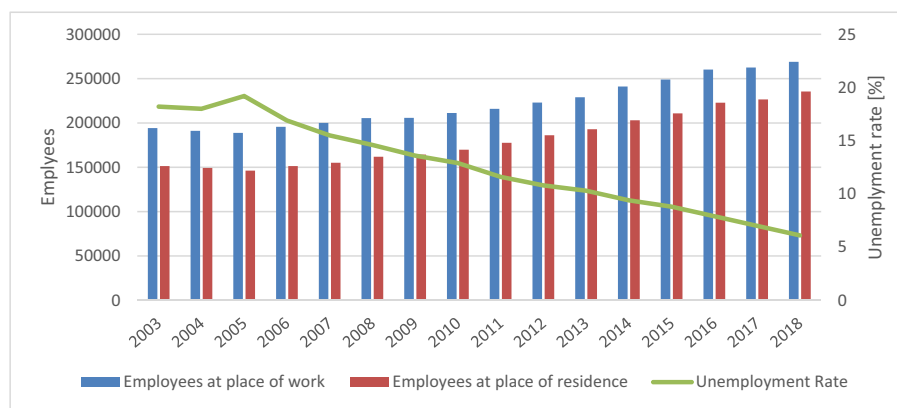


Fig. 3. Employment and unemployment 2003–2018.

Table 2

Population change in Liverpool (the core city) and Merseyside (the city region).^a

Source: Census of Population & OPCS Mid-Year Estimates.

	Liverpool (the core city)	Merseyside (the city region)	Liverpool population as a proportion of Merseyside population
1981	503,726	1,503,120	33.5%
1991	480,196	1,438,000	33.4%
2001	439,476	1,362,026	32.3%
2011	466,400	1,380,770	33.7%
2018	494,800	1,423,000	34.8%

^a Merseyside (the city region). This is a slightly different definition of the city region than that of the new larger administrative Liverpool City Region introduced by the Government in 2015.

adversely affected by the financial crisis in 2008 but experienced a continuation of the economic boom that had begun in 2005 and which, in the 2010s, fuelled international immigration that concentrated on big cities such as Leipzig.

4.2. Liverpool

Liverpool is a major port and regional city in North-West England. From the 1950s to the 1990s economic change and de-industrialisation reduced employment and population. Disurbanisation occurred as population migrated away from the conurbation in search of work and suburbanisation pushed a growing proportion of the remaining population beyond the core city to the periphery (Sykes et al., 2013). Of all the case study cities, Liverpool was the first to experience industrial restructuring and change in the 1970s. In that decade vast swathes of

former dockland, railway land and heavy industrial sites became dis-used and derelict.

Central government's response was initially aimed at stimulating inward industrial investment. While this policy had some success, much of the new investment was at the periphery of the conurbation. Whereas the core city had accommodated nearly 48% of the city-region's population in 1951, this had fallen to around 32% by 2001 (Table 2). Housing vacancy in the inner city was also rising.

Employment across the city region fell from 459,000 in 1981 to 382,000 in 1991, while employment in the core city fell from 254,000 to 195,000. Thereafter employment rose steadily and by 2017 stood at 626,700 jobs in the city-region and 242,600 in the core city (Labour Market Profile – Liverpool, n.d.; Turok & Edge, 1999). The question is why did this change occur?

Firstly, national economic growth improved from the mid-1990s. While the greatest benefit was experienced in London and the South-East, the effects gradually spread across the country. Similarly the first signs of reurbanisation emerged in the 1990s and by the millennium had become an established trend across the country. Between 2002 and 2015 the total population living in the ‘core cities’¹ grew from 4.91 million to 5.49 million (an increase of 12%). Secondly, by the 1990s suburbanisation had been brought under control. Over the previous two decades most of the city's older housing stock had been refurbished and benefitted from local environmental improvements. Policies encouraged and subsidised the redevelopment of former industrial and commercial premises for residential use. The Merseyside ‘green belt’ prohibited development on rural land at the urban periphery. Together these layers of policy drastically reduced suburbanisation. Thirdly, the rapid de-industrialisation of the 1970s and 1980s had slowed by the

¹ The ‘core cities’ include Birmingham, Bristol, Cardiff, Glasgow, Leeds, Liverpool, Manchester, Newcastle-upon-Tyne, Nottingham and Sheffield.

Table 3

Employment change in Liverpool (the core city) by economic sector.

Source: Labour Market Profile – Liverpool. Liverpool employee jobs by industry: time series data. (www.nomisweb.co.uk, accessed 08.10.2019). Data for 16 sectors aggregated to 5 groups by the author.

Sector	2009	2012	2017	Rate of growth 2009–2017
Manufacturing, utilities, construction	18,835	15,210	19,710	+ 4.6%
Hotels, catering, arts, recreation (leisure & tourism)	24,000	22,000	31,000	+ 29.1%
Retail, wholesale, logistics, other	43,665	46,790	50,000	+ 14.5%
Financial & professional services & support	47,500	57,000	55,000	+ 15.8%
Public administration, education, health	95,000	86,000	86,000	– 9.5%
Total	229,000	227,000	241,710	+ 5.6%

Table 4

Selected indicators of economic and demographic development in the Lodz region (2003–2012).

Source: Polish Statistical Office.

	2003	2005	2008	2010	2012	2014	2016	2018
Population								
Suburbs	373,626	374,885	377,214	383,300	384,610	385,647	386,213	387,800
Lodz	779,129	767,628	747,152	730,633	718,960	706,004	696,503	685,282
Total (region)	1,152,755	1,142,513	1,124,366	1,113,933	1,103,570	1,091,651	1,082,716	1,073,085
Unemployment rate								
Suburbs	n.a.	21,8	10,8	14,3	17,0	13,5	9,9	5,5
Lodz	n.a.	16,4	6,8	10,0	12,0	10,7	7,9	6,6
Gross regional product (mln PLN)								
Suburbs	7002	8218	10,945	11,881	13,301	14,411	15,834	n.a.
Lodz	20,723	23,026	30,257	34,199	36,966	39,537	41,465	n.a.

mid-1990s and was replaced by a more stable economic situation.

A series of economic regeneration initiatives emerged (Couch, 2003; Meegan, 2003; Sykes et al., 2013). From 1993 to 2007, regeneration was assisted by £1.6 billion through Objective One of the European Regional Development Fund supporting important infrastructure and economic regeneration projects. After 1997, the central government promoted an ‘urban renaissance’ agenda, supporting the revitalisation and repopulation of cities across the country. By the millennium much of the city's brownfield land had been brought back into beneficial use. Housing vacancy rates fell back from their historic high of 7.5% to around 4.5% in 2015 (Couch & Cocks, 2013). In this period Liverpool also witnessed expansion in higher education, health, financial services, IT and biosciences. The city was designated European Capital of Culture in 2008 and subsequently pursued a strong policy of cultural and tourism-led regeneration.

In consequence of these economic changes, employment began to rise again. Through the period of recession jobs had been lost faster in the core-city (Liverpool) than in the city-region as a whole but between 2010 and 2016 while city-regional employment grew by 5.5%, in Liverpool (the core city) the rate of growth was 7.6%: a more *urban* economy was returning to the city-region (Labour Market Profile - Liverpool).

With regrowth came a change in employment structure. Table 3 shows changes in the employment structure of the core city. Between 2009 and 2017 employment in manufacturing, utilities and construction employment finally began to increase after many years of decline. There was rapid employment growth in leisure and tourism, and significant growth in retailing, wholesaling and logistics, and in financial and professional services. While total government public spending was maintained and welfare spending actually increased after the 2008 financial crisis, funding to local councils (for local amenities, housing, transport, etc.) was cut earlier and harder than the rest of the public sector as the government implemented its deficit reduction strategy. In consequence there was a fall in local public administration, education and health employment.

Thus Liverpool has turned from shrinkage to re-growth as a result of: i) national economic growth, especially in *urban* economies and the

service sector; ii) ending the period of rapid industrial restructuring; iii) consistent long-term regeneration strategies including substantial EU and central government funding; iv) strong restraints on peripheral growth; v) intensification of development within the core city.

4.3. Łódź

From the mid-19th century Lodz became a mill town dominated by the textile industry. The end of *Textilopolis* came in the early 1990s and paralleled the downfall of socialism in Poland (Marcinićzak & van der Velde, 2008; Szafrńska et al., 2019). Over the next two decades (1988–2005) Lodz lost almost 100,000 residents and the number of vacant apartments nearly tripled between 2003 and 2018 (but still only represented about 2% of the city's total dwelling stock). Manufacturing's share of employment fell by almost 20% while the share of services in the total employment increased significantly (Marcinićzak, 2009).

The economy began to recover in the late 1990s, mainly spurred on by foreign direct investments in manufacturing industry, which gained momentum after Poland's accession to the EU in 2004 (Marczinczak & Sagan, 2010) (Table 4). The more modern industrial areas towards the periphery of Lodz were the first to be reindustrialised, whereas the older industrial areas of the inner city (many dating back to the 19th century) remained derelict until after the millennium when some sites gradually began to attract residential investment, leading to land use change and area gentrification (see Holm et al., 2015). Also the approach to urban regeneration changed significantly after 2004, when new funds became available, and included the comprehensive regeneration of public tenements, a large-scale redevelopment project covering 100 ha of the city centre, a new central railway station and additional cultural facilities.

Why does urban shrinkage continue in Lodz despite economic regrowth? Lodz has not made the turn from demographic shrinkage: the population is still in decline. The reasons appear to be mainly demographic: continuing suburbanisation, low birth rate, ageing society, and migration abroad after 2004.

There are four groups of context-specific factors that have explicitly or implicitly contributed to population decline in Lodz:

- i) institutional factors: reforms of the territorial self-government that put more financial pressure on municipalities - they struggle to attract new residents (tax payers) and new investments; a dismantling of the comprehensive planning system that has paved the way for uncontrolled suburban development; chaotic regeneration policies, or a complete lack of such activities, in the 1990s; restrictive immigration policies at the national level.
- ii) geographical factors: Lodz is located only 120 km from Warsaw, which fuels a continuous outmigration of young people.
- iii) economic factors: lower salaries compared to the other large cities in Poland and a lack of comprehensive strategy for economic redevelopment in the early 1990s.
- iv) demographic factors: the generally low birth rate and ageing society in Poland and the massive post-EU-accession outmigration from Poland to western European countries.

What factors are influencing further shrinkage in Lodz, or hindering regrowth? How do they operate together? For the last 15 years, the city has been losing residents, but the economy has been growing and unemployment has been falling. The development of Lodz's economy parallels rapid economic development of Poland in the 21st century. Poland's economy was on the rise even in the midst of the last global economic crisis. Economic regrowth was largely externally stimulated either by massive private/public investments in transport infrastructure (highways) or foreign direct investments in manufacturing industry and services. More recently, Lodz has gained new jobs in the Business-Process-Offshoring sector and the IT-sector. Put differently, the economic regrowth of the city offers opportunities for both low-skilled and high-skilled workers. Currently, the main problem limiting faster economic development is the shortage of the latter category of workers. But Lodz is a university city and unlike in the other major Polish cities, skilled labour is still available, but not in sufficient quantity. Finally, a more comprehensive, recent approach to regeneration and the construction of the New City Centre may further boost economic development, but may not stop population loss.

Thus, irrespective of the continuous economic development over the last decade, Lodz has not turned from population shrinkage to regrowth. Nationally the population is ageing and declining yet suburbs are growing around most large and medium-sized cities. Lodz is ageing faster than other large cities and has experienced uncontrolled suburbanisation due to a lack of comprehensive spatial planning and delayed regeneration of its run-down city centre. It also suffers from a negative media image (it is known as "the fallen city") that deters inward migration.

4.4. Ostrava

Ostrava is the third largest city in Czechia by population and is located in the Moravia-Silesia region in the North-East of the country. The story of the development trajectory of Ostrava as a whole is the

Table 5

Population change in Ostrava (the city), Ostrava-město (the district) and Moravian-Silesian region.

Source: Public database, Czech statistical office (https://vdb.czso.cz/vdbvo2/faces/cs/index.jspx?_afz=uziv-dotaz#k=5&pvoxc=100&uroven=30&w=).

December 31	Ostrava (the city)	Ostrava-město (the district)	Moravian-Silesian region
1991	327,413	327,413	1,290,151
1996	323,870	323,870	1,287,413
2001	315,442	315,442	1,265,912
2006	309,098	309,098	1,249,290
2011	299,622	329,961	1,230,613
2016	291,634	323,464	1,209,879
2018	289,128	321,273	1,203,299

story of more than 160 years of economic and population growth based on hard coal mining (1830–1989) and continuing economic and population shrinkage since 1990. The population reached its peak in 1990 with 331,219 inhabitants but this had fallen to 289,128 by 2018 (Table 5). This trend of steady population decline is similar to that experienced in other large Czech and European old industrial cities. Today Ostrava remains an industrial city with environmental pollution, social exclusion and controversial image.

Despite a decline in population, Ostrava has experienced a very low level of housing vacancy due to a shortage of supply and high demand. Our own analyses based on real estate agencies websites in 2019 showed that out of a stock of over 80,000, only 335 dwellings were for sale and 457 for rent in the whole city. Vacancies were generally higher in less attractive areas, such as the large housing estates on the fringe of the city.

In 1989, in the whole Ostrava region worked 115.000 employees in the mining sector. The closure of all urban mines and many in the region in 1994 had severe impacts on the employment situation. In 2020, employment in the mining sector was only 10,000 persons. The situation of people employed in heavy industries was pretty much the same. Approximately, employment in iron and steel production in the Ostrava region fell from 70,000 in the early 1990s to 7000 today (2020). The manufacturing sector covers 31% of total employment, the same as in the 1990, just the structure changed – today, jobs in chemical industry and metallurgy considerably decreased in numbers while jobs in automotive and electrotechnical industries increased, also due to the increased impact of FDI. This restructuring also had an impact on land use: today 4–7% of the territory of Ostrava is defined as brownfield (FajnOva, n.d., Strategy of Development for 2017–2023).

What have been the reasons of shrinkage? The causes of the urban shrinkage 1990–2018 in Ostrava include:

- i) Deindustrialisation, economic transformation and restructuring, especially job loss and unemployment in mining and the iron and steel industries (Table 6) which led to job related out-migration of young, well educated people to other Czech regions and abroad.
- ii) Suburbanisation, i.e. the movement of people from the inner city or neglected housing estates to the 'villages' on the fringes of Ostrava or even beyond the administrative borders of Ostrava city.
- iii) Rapid drop in birth rates in the whole Czechia as a natural adaptation to the second demographic transition i.e. to the low birth rates and prolonged life expectancy found in Western European countries.

What factors are influencing further shrinkage in Ostrava, or hindering regrowth? How do they operate together? Ostrava has been assessed in the context of re-growth theory and in comparison with re-growing cities Leipzig and Liverpool. Despite continuing population decline, the economy of Ostrava has improved and is developing significantly. In comparison with Leipzig or Liverpool, Ostrava is developing in a context of rather different external conditions, which include a rejection of a pro-active role for the public sector, strong Prague centralism and powerful national controls over immigration.

In the case of Ostrava, several factors have come together to operate as barriers for growth or as causes of ongoing shrinkage.

Table 6

Rate of unemployment in Ostrava (the city) and Ostrava-město (the district). Source: Ministry of labour and social affairs (<http://portal.mpsv.cz/sz>).

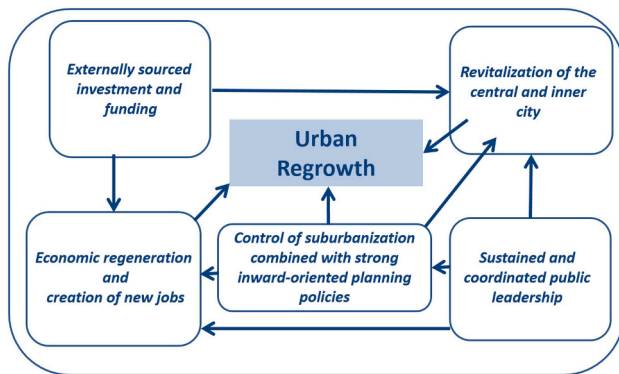
	1997	2000	2005	2010	2015	2019
Ostrava (the city)	6,5	16,5	15,6	11,7	10,5	5,1
Ostrava-město (the district)	6,7	15,1	14,7	11,9	8,9	5,1

Table 7

Employment change in Moravian-Silesian region by economic sector (CZ-NACE).

Source: Labor Force Survey, Czech Statistical Office (<https://www.czso.cz/csu/czso/trh-prace-v-cr-casove-rady-1993-az-2017>).

Sector	1995	2000	2005	2010	2015	2017	Growth rate 1995–2017
Mining	41,416	31,767	21,803	17,520	15,815	11,531	−72,2%
ICT	8649	8374	9251	13,973	12,853	16,299	88,4%
Finance and insurance	6507	9609	8291	11,025	9427	9888	52,0%
Professional, scientific and technical activities	12,819	3989	14,835	13,974	22,484	23,127	80,4%

**Fig. 4.** Major drivers influencing urban regrowth.

Source: Authors' work.

- i) Ostrava's economic base has been reindustrialised and has not followed the post-industrial route of similar West European cities. While there has been a considerable increase of jobs, income levels are generally lower than in the cities of Prague or Brno. After 1990 Ostrava pursued an 'external low road strategy' based on low wages and low costs of inputs and subsidies, which attracted FDIs into the region. In this sense Ostrava has been successful and approximately 40,000 new jobs were created in 2000s, especially in the automotive industries (Rumpel et al., 2013). There has also been a significant increase of jobs in services and ICT industries (Table 7).
- ii) Negative demographic development. Out-migration from Ostrava is stronger than in-migration into the city region. Although, despite national government discouragement, the country has experienced some immigration, mainly from the Ukraine, Russia and Vietnam, there has been no significant immigration into the Ostrava region.
- iii) While there has been some government investment in infrastructure it is limited in scale and not concentrated on priorities such as housing or creation of quality jobs.
- iv) Failures of the public sector in the field of planning policy. While there has been public sector support for investors and private companies, there has been a lack of similar support for city centre re-development or housing policy. This neoliberal approach to planning has supported suburbanisation and urban sprawl. Suburbanisation has been seen by policy makers as a desirable phenomenon and as a solution or compensation for the lack of new attractive affordable housing in the inner city.
- v) Air pollution as push factor of out-migration has been reduced significantly, although still remains relatively high.

While Ostrava has managed to attract investors, create jobs and carry out basic changes to economic and urban structures, these have not been sufficient to contribute to population re-growth. Thus Ostrava is likely to continue to be a shrinking city for the foreseeable future. However, in comparison with similar old industrial cities in Central Europe, Ostrava can be considered successful in the way it is transforming from a mining-industrial city with a stronger role of retail, education and services.

5. Discussion and conclusion

Having reviewed the literature (especially studies analysing factors and their interconnections such as Power et al., 2010, Power & Katz, 2016, Carter, 2016, Newman et al., 2018) and analysed our four case study cities, we can conclude that there is not just one factor driving regrowth but several. Most of these factors interact with each other in various ways, either in sequence or in parallel. It is not just the presence or absence of a factor or factors that determines regrowth but a combination of them being either present or absent. Through the contrasting comparison, we have seen that more than economic recovery or job creation and investment are required to stimulate urban population regrowth. While the cases of Lodz and Ostrava strongly falsify neoliberal assumptions that economic growth alone is a solution for shrinking cities, the Leipzig and Liverpool cases show how necessary external support and public investment have been in assisting local economic restructuring and creating the conditions for population regrowth.

Strong public engagement also helps sustain regrowth by supporting the creation of more attractive living conditions (including housing, public space, green space, cultural amenities etc.). In terms of sustainable development, the multiplier effects of such investment and regrowth of population are likely to stimulate further economic growth and make the city less dependent on external private or public finance in the future. To consider this question in a systematic way, Fig. 4 provides an indication of the relationships between the major drivers influencing regrowth.

The figure shows how urban population regrowth is dependent upon three stimuli:

- i) Economic regeneration and creation of new jobs, which is itself dependent upon externally sourced investment and funding, at least initially, but also requires sustained and coordinated public leadership, not least to control suburbanisation and to pursue strong inward-orientated planning policies that direct investment to the right places.
- ii) Revitalisation of the inner city, which has similar requirements to economic regeneration but includes a focus on investment in those areas of the city combined with other investment that supports improvements in local living conditions (including housing, public space, green space, cultural amenities, etc.).
- iii) Control of suburbanisation combined with strong inward-orientated planning policies, which require sustained and coordinated public leadership.

5.1. Why did Leipzig and Liverpool make the turn towards demographic regrowth and economic recovery, while Ostrava and Lodz did not, and are shrinking further?

When looking at precise factors driving demographic regrowth, it seems clear that, in the cases of both Leipzig and Liverpool, a bundle of five decisive factors were key to regrowth. In the case of Łódź and Ostrava, which do not yet show any significant signs of regrowth, these factors have been partly or completely absent. These factors are now considered in more detail:

- i) *Externally sourced investment and funding.* Liverpool and Leipzig have both benefitted from substantial externally sourced public investment in growth-supporting infrastructure including internal and inter-regional transportation improvements, urban regeneration, housing, social, educational, training and cultural enhancements as well as ecological revitalisation. Much of this funding came through coordinated EU and National Government programmes that ensured a planned and consistent approach to investment. These programmes had a multiplier effect in stimulating inward private investment, either in collaboration with the public sector or, as time progressed, independent of the public sector.
- ii) *Revitalisation of the central and inner city.* With help from external sources both cities have invested strategically into a comprehensive regeneration and revitalisation of their inner cities. The inner cities have seen investments in public transport, public realm improvements, the retail sector, culture, leisure and tourism facilities. Further, the changing nature of the central area economy has freed up former industrial and commercial space for housing development, providing a new attractive housing supply close to city centre employment and amenities. Programmes of housing and area improvement enhanced the image of inner cities and increased their ability to retain existing populations and attract incomers, counteracting previous decades of suburbanisation. Students and young adult households have been critical early pioneers in the repopulation process.² A further point is that in Liverpool in particular and UK cities in general the spatial capacity for reinvestment (amount of brownfield sites) and the large rent gap resulting from the scale of industrial restructuring has facilitated and stimulated regrowth more than in some other national and city contexts (Dembski et al., 2019).
- iii) *Economic regeneration and creation of new jobs.* Parallel with the revitalisation of the inner city, economic regeneration and the creation of a considerable number of new jobs has encouraged inward population migration from elsewhere, counteracting the previous period of suburbanisation and supporting the regrowth of the city-region. Economic regeneration has either been divided between the manufacturing and service sectors (Leipzig, Łódź, Ostrava), or as in Liverpool, more focused on the service sector, particularly in the central city. We see, although at different levels and in different shape, economic regeneration and job creation happening in all four cities; the difference is that Leipzig and Liverpool see also new population growth while Łódź and Ostrava do not. This means that economic recovery itself does not necessarily lead to new population growth unless other key elements of regeneration policy (e.g. appropriate housing in the core city or control of suburbanisation) are also achieved.
- iv) *Control of suburbanisation combined with strong inward-oriented planning policies.* In both cities, this general economic regeneration, central area revitalisation and inner urban housing investment was supported by strategic planning policies orientated towards re-use of existing urban space and the creation of a more compact city. In Liverpool, this comprised a two pronged strategy of investing in the existing city while strictly controlling peripheral development across the city-region. In Germany, the subsidies for suburban housing were cancelled in 2006 and new policies deliberately supported the development within core city boundaries or prevented people from house building in suburbia. By contrast, neither in Łódź nor in Ostrava are there yet adequate measures to control suburbanisation.
- v) *Sustained and coordinated public-sector leadership.* Both Liverpool and Leipzig show evidence of sustained and coordinated public-sector leadership and management of the regeneration and planning processes that have led to population regrowth. Despite various political differences and changes in institutional and administrative arrangements, the UK national government, regional agencies (when they existed) and Liverpool City Council have been consistent in their support for urban regeneration combined with restraint on suburban growth for more than thirty years. Similarly, in Leipzig, the federal, regional and local agencies of government have shown consistency in their support for the compact city and in their willingness to invest in and manage the regeneration process.

There are differences in national context, too, that affect the likelihood of population regrowth within cities. The populations of both Germany and the UK are expected to grow by over 3% between 2015 and 2020; whereas, with lower birth rates and higher net out-migration, growth in the Czech Republic is expected to be less than 2% and Poland to shrink by 0.3% (Eurostat, National population projections, accessed 26.1.2018).

In contrast to Leipzig and Liverpool, Ostrava and Łódź have not benefitted from these factors in a comprehensive, coordinated and sustained way. Although Łódź, and to a lesser degree, Ostrava have seen a reshaping of their economic base, a degree of economic and employment growth and have received EU funding for urban development projects, neither city has yet experienced significant population regrowth. Neither has undertaken the level of comprehensive inner-city regeneration seen in Leipzig and Liverpool and urban sprawl has not been adequately controlled. Nor would it appear that local or regional authorities are yet as committed to the idea of the compact city as has been the case in Leipzig and Liverpool.

There is, to some degree, a decoupling of economic growth and population growth in these cities which suggests that they are following different trajectories. The examples of Łódź and Ostrava show that economic recovery does not necessarily stimulate population regrowth as both cities continue to experience age-selective suburbanisation and negative natural population development.

5.2. To what extent is regrowth driven by the national and regional context?

While local factors and contexts are significant, the regrowth of Leipzig and Liverpool cannot be explained by local actions alone, national and regional contexts are important.

- i) *Investment in the economy and housing.* Economic redevelopment and job growth were not primarily driven by local resources or decisions. They were dependent on (inter)national decisions and funding. Local factors such as the availability of moderately-priced and attractive inner-city housing and appropriate areas for settling larger industries as in Leipzig or cultural flagship developments as in Liverpool were supporting factors but have to be seen as subsidiary in importance. Without these external, higher-level trends and investment decisions neither Leipzig nor Liverpool would have seen regrowth and despite their recent successes, both cities remain heavily dependent on external economic decisions and their economic situation remains fragile. For the present they remain what Power et al. (2010) defined as “weak market cities”.
- ii) *Governance decisions.* The regrowth of Leipzig and Liverpool was in each case structurally and economically enabled, to a large extent, by the socially responsible nature of their respective national governments. The external public sector regeneration funding that flowed from the national state's orientation towards social and environmental responsibility was key in facilitating and generating subsequent private investment. In this sense, neither is a “Phoenix city” (Power et al., 2010) that has emerged from its industrial ashes by its own power. As for Łódź and Ostrava, national factors such as

² See here also the concluding chapter in Power and Katz (2016, 288) that mention the recovery of the inner city and active fight against sprawl as crucial public policy activities to overcome shrinkage. Also Couch and Fowles (2018).

the lack of a coherent urban policy and shortcomings of national funding put pressure on the local municipalities and do not provide a reliable framework for long-term strategic planning.

5.3. What do we learn for the general debate?

Neither Liverpool nor Leipzig could yet be called prosperous, their economic base remains fragile and vulnerable to external decisions nor is there any guarantee that population regrowth will continue in the long-run. In terms of economic growth theories, this means that regrowing cities necessarily need to represent a target area for both labour and capital flows. When looking through this “lens” Leipzig and Liverpool appear to be different from Lodz and Ostrava in terms of having benefitted from long-term, coordinated public sector support and investment but similar in that all four are relatively poor post-industrial cities with a high level of external dependency.

While population regrowth is an important indicator of urban change and a useful tool for inter-urban comparison, alone it is insufficient to fully reflect the multidimensional nature of urban change: more complex analysis is required. In the case of Łódź, economic and population development appear to go in opposite directions. Why this should be is unclear. It may be due to lack of housing capacity, insufficient inner city revitalisation, inadequate control over suburban development, or indeed the nature of the local economic development itself. The relationship between economic development and population regrowth needs to be better understood. Any disconnect between population and economic development trends for a city might also challenge the presumed utility of population as a key indicator in many existing conceptual models or heuristics of urban change. Furthermore, the development of cities is not limited to its administrative boundaries. Processes such as flows of people and workforce, the spatial allocation of investment as well as the physical extension of settlement structures suggests that a different picture can be expected when widening the analytical scope to the whole urban region.

Unlike Power et al. (2010) and Carter (2016) this study has not emphasised the actions of local policy-makers in relation to urban population change. The focus has been on understanding which factors and what contexts are driving or promoting regrowth. From the analysis of the four cases, it seems clear that there is no certainty that shrinkage will be followed by population regrowth within any specified period of time. Further, a city may experience an economic upturn yet still experience shrinkage due to the suburbanisation of its population. Thus far the economy of regrowing cities appears to remain fragile and vulnerable to external decisions. National policy plays a crucial role. Here, welfare state policies can be distinguished from neoliberal policies. While neoliberal policies only promote economic growth, welfare state policies refer to urban development in a more integrative way. This helps to explain why cities in more welfare-based countries such as Leipzig in Germany and Liverpool in the UK show broader growth while cities in more neoliberal contexts such as Lodz and Ostrava only grow economically.

In terms of future research, there is a need to: i) understand the impact on regrowth of policies at various scales from local to national; ii) analyse the relationship between economic development and population regrowth; iii) examine the dynamics of population regrowth when analysed at the regional and city-regional levels; iv) achieve a more complex and nuanced understanding of urban change than life cycle models currently predict - both in spatial and process-related terms.

In terms of policy implications, the identified factors that drive regrowth can be well understood as general implications for policy-makers. Furthermore, a lesson learnt from our analysis can be that any process of regrowth draws on a set of several factors that interact; regrowth needs, subsequently, a multiple policy approach to be stabilized or continued. Such an approach includes economic and employment factors, inner-city development, an inward-oriented development and

clear strategy. The role of external funding must not be underestimated due to the economic fragility of (early) regrowth.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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