

SHRINK SMART

WP3: Synthesis (I): Challenges of shrinkage

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D7 Discussion paper on cross-cutting challenges

Structure

1. Introduction
2. Trajectories of shrinkage
 - Causes of urban shrinkage*
 - Dynamics of urban shrinkage*
3. Impacts of shrinkage: cross-cutting challenges
 - Overview*
 - Arenas of urban development*
4. Challenges of urban shrinkage: Conclusions for further research and urban practice

This paper represents the summarizing result of the first phase of research of the SHRINK SMART project, in particular the cross-national and cross-cutting analysis of urban shrinkage. It is a result of the D5 cross-cutting analysis paper and the discussions of that paper within the project consortium during the second full meeting in June 2010. This paper includes a comparative assessment of the shrinkage analysis for all case study cities with respect to the WP1 analytical model and the arenas of impact that were analyzed in the WP2 D4 reports. It comes up with working hypotheses concerning the impact of shrinkage and resulting challenges for urban development as well as with newly emerging questions for further research. The paper serves, together with the WP2 D4 reports, as a basis for the WP4 stakeholder workshops in each of the case study cities, and as a basis for the WP5 governance analysis. In a way, the D7 discussion paper represents also a “living document” since it will be constantly improved in the later course of the project.

1. Introduction - cross-referencing the analysis of local settings of urban shrinkage

With regard to causes, trajectories, temporalities and dynamics of urban shrinkage the case study reports have revealed both commonalities and differences among the cities studied. Having cross-referenced all the case studies concerned, it has become obvious that urban shrinkage is a spatially and temporally uneven process that shows a differentiated dynamics in terms of duration, scope and speed. While phases of massive and rapid shrinkage have been detected in some of the cities, others have undergone a long-term but gradual ('subtle') process which – at first sight – is not that spectacular, but has nevertheless been measurable and impacting.

Moreover, not all of the cities have been affected by shrinkage in the same manner. While, for example, population loss has led to a severe housing surplus in the two eastern German cities of Leipzig and Halle, no other case study within the sample has been characterized by this problem to such an extent. (Post-) mining cities have had to cope with derelict mining lots as well as a variety of hazards emanating from the closed mines located in urban areas - a problem that did not appear in the same form in other cities. Similar specificities can be found in nearly all of the cases studied.

In addition, the situation of the cities under investigation appears in a different light when compared to the respective national urban trajectories. Thus, the postsocialist case studies represent no particular exception from their national urban systems. Shrinkage is the predominant type of urban development in Poland and a 'normal' trajectory of urban development in Czech Republic, eastern Germany, Romania and Ukraine. Nevertheless, important differences between our case study cities remain: while some of them have managed to sustain their position within the national urban hierarchy (e.g. Leipzig, Donetsk, Sosnowiec, and Timișoara), others have all but lost importance.

In all the 'postsocialist' case studies, the systemic change has had a profound impact on the development of urban shrinkage. It has either represented the starting point for deindustrialization, the break-down in birth rates and suburbanization (as it has been the case in Halle, Ostrava, Sosnowiec, Donetsk and Timișoara), or it has led to an acceleration of processes that had already begun before 1989 (as it has been the case in Leipzig, Bytom and Makiivka). Starting from this observation, one could reasonably ask whether there exists a 'postsocialist' pattern of urban shrinkage in the way that the systemic change and its socio-economic consequences had been a catalyst of similar processes which have eventually ended up in urban shrinkage and decline after the breakdown of the Communist party rule in the respective cities and urban regions. At the same time, the systemic change has also brought a number of improvements and new qualities for the postsocialist cities in the following fields such as housing, living standards or environmental pollution. Thus, despite shrinkage, the postsocialist transformations have enhanced the quality of life in some of these cities. The question whether the postsocialist condition represents a specific framework condition for urban shrinkage resulting in specific consequences, too, has to be discussed further.

Meanwhile, some of the cities under investigation have ceased shrinking or have stabilized their population development (e.g. Leipzig, Genoa or Timișoara), whilst others have continued and will be losing further inhabitants in the short- to medium-run. Liverpool has almost stopped, although the recent recession may have exacerbated the problems again. Nonetheless, even those cities which have managed to overcome urban shrinkage still have to cope with the long-term consequences of population loss, for example, with housing vacancies, derelict land and progressing ageing. Since these cities are located in the target regions for domestic in-migration and international immigration by the young people, their fortunes ought to depend on the development of these population inflows. In the case of young in-migration, the overall ageing of population would lead to a decrease in the potential for young

in-migrants. In the case of international immigration, the future population trajectory would greatly depend on (geo-)political developments as well as national and EU-wide immigration rules and policies. Given the significant uncertainties involved, the resurgence or recovery of these cities can be jeopardized, before turning into new waves of population loss in the near future.

In all of the case studies, the impact of urban shrinkage has varied between various parts and districts of the cities and urban regions. In almost each of the case studies, there were areas or districts of a city, which have been particularly hit by urban shrinkage in terms of population loss, housing vacancies, brownfields, derelict land and dilapidation. In the extreme cases, the functioning of an urban district has been endangered by the population outflow and its consequences (e.g. in Ostrava-Hrušov as the consequence of the 2002 flood), or the combination of population loss, housing vacancies and demolition activities (e.g. Halle-Silberhöhe). In other cities which have managed to recover from the overall decline, such as Liverpool, Timișoara and Leipzig, there have been further intra-urban imbalances: as some districts start to re-gain population, others keep locked into the shrinkage trap. Resurgence and decline are, thus, often situated in close proximity to each other. Other forms of differentiated developments can be found at the regional level. In all the three conurbations concerned (Leipzig-Halle, Sosnowiec-Bytom and Donetsk-Makiivka), there have appeared to be significant differences between each of the two cities respectively, with one of the cities (typically, the smaller and/or more mono-industrial one) being more seriously affected by shrinkage (at the moment).

To sum up the first finding of our analysis, we can state that the trajectories, dynamics and forms of shrinkage are highly uneven and to a large degree dependent on the particular contexts. This will be further elaborated in the following chapter.

2. Trajectories of urban shrinkage

Causes of urban shrinkage

The most widely-spread reason for urban shrinkage (population loss) has been deindustrialization in combination with job-related out-migration. In almost all of the cases concerned, demographic change (negative natural growth, ageing, downsizing of households and household numbers) has played a decisive role as a trigger of urban shrinkage/population decline. In certain cases, the impact of demographic change has become more decisive at the later stages of urban shrinkage, mostly as a consequence of the selectivity of population loss (e.g. the above-average outflow of young people and families from Leipzig and Halle). Apart from deindustrialization itself, the loss of a specific economic function represents another important reason for urban shrinkage, as it has been the case for the two port cities of Liverpool and Genoa, and might become the case for some of the old industrial cities in our sample in the future. In some cases, suburbanization – as a consequence of the suburbanization of businesses and jobs and changing housing preferences – has played a central role as the reason for shrinkage (e.g. in Genoa, Leipzig, Liverpool, and Ostrava).

Although the causes for shrinkage are thus fairly diverse across the analyzed cases, in all of them there has been a close relation between demographic and economic processes which have had an impact on settlement structures, land use patterns, and population composition of the particular cities. At the moment, we identified the three following major complexes of causes of urban shrinkage with respect to the case study cities concerned:

- economic decline and job-related out-migration,
- suburbanization and a change in the settlement system, and
- demographic change (death surplus and ageing).

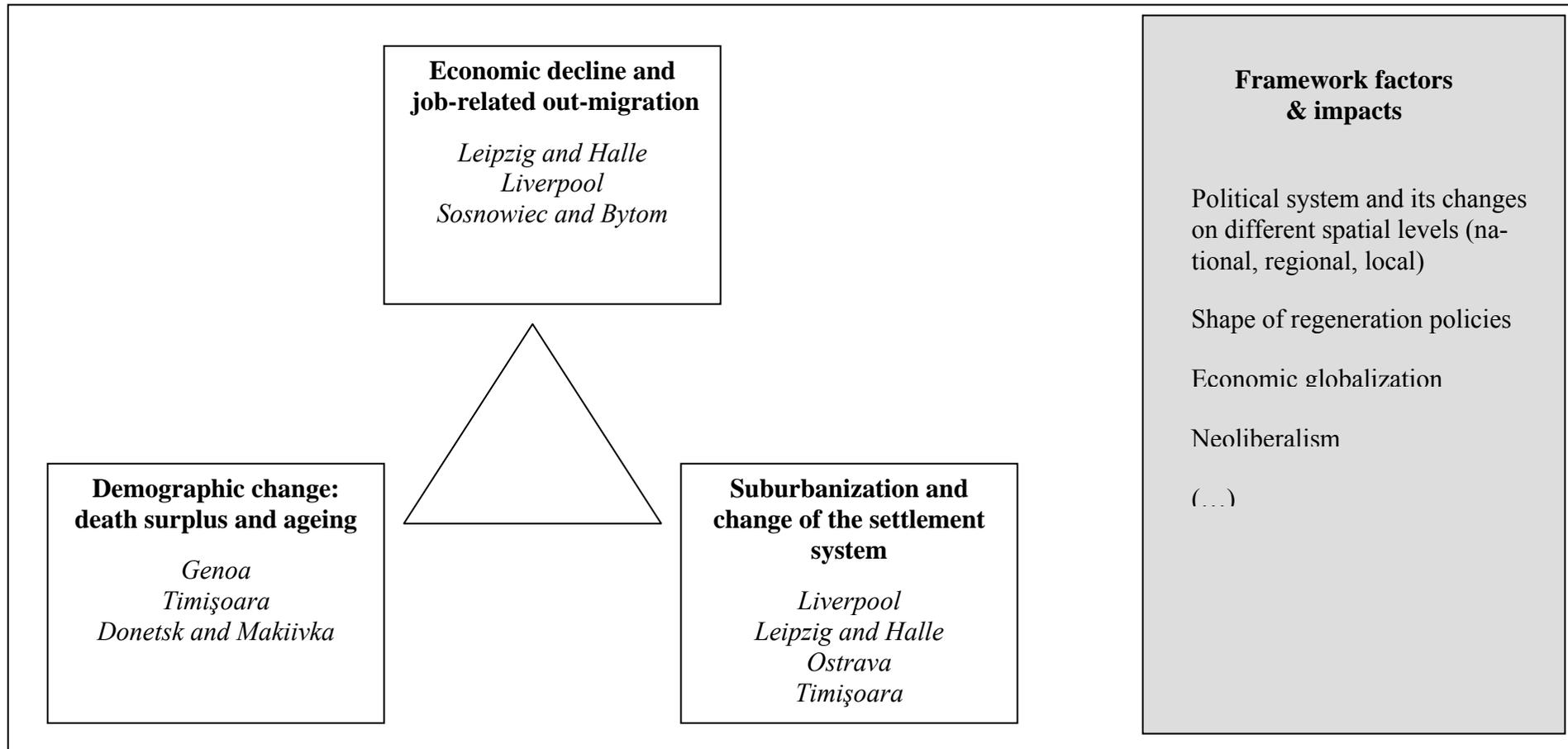
These determining causes are influenced in their dynamics by other intervening factors such as the political system and its changes on different spatial levels (national, regional, urban, and local), the shape of regeneration policies, the physical structure of the city, cultural factors, etc. Figure 1 illustrates this approach and assigns the case studies to the above developed typology of causes.

The core argument put forward in this diagram is that shrinkage is not a single process in itself but rather a combination of three macro-developments (economic changes, demographic developments, changing settlement structure) that impacts on cities in a very time- and place-specific manner and leads to population losses. Thus, while in eastern Germany economic changes, demography and suburbanization all play an important role in causing a downturn in population figures, in the case of Genoa or Timisoara population losses cannot be attributed to the economic situation. As a consequence, urban shrinkage does not only have different causes, but quite often it reveals itself in different combinations of causal mechanisms.

At the same time, shrinkage can only be understood when set into its context; thus, it makes a difference whether population losses appear in the situation of tight or weak housing markets, in compact or fragmented cities, or in the situation which is characterized by accentuated national welfare politics, or neoliberal globalisation. All these factors have an impact on the form of urban shrinkage, so that the outcome of similar macro trends (economic and demographic change, changing urban form) is often fairly different from place to place.

Moreover, the assignment of cases to particular causal characteristics must not hide the fact that the cases have all had certain definite particularities. In other words: each case assignment contains a specific story of economic decline and job-related out-migration, suburbanization, and demographic change, rather than a 'one size fits all' trajectory. Yet to arrive at a certain generalization, we have decided to apply a typology approach for it allows us to identify important causes behind the urban population loss, whilst a similar pattern can be observed in very different cities and regional/national circumstances. The same is true for the impact of framework conditions which are listed in the right box of Figure 1.

Figure 1: Predominant causes of urban shrinkage: assigning the SHRINK SMART case studies



Source: authors' work

Dynamics of urban shrinkage

In our analytical model (WP1 D1-D3 paper), we have already stated that *urban shrinkage differs in terms of scope and speed as well as in dynamics over time*. The case study reports have *pointed to* some remarkable evidence regarding this assumption. The following summary lists some of the observations made during the cross-referencing of the reports:

- *Leipzig and Liverpool represent cases of long-term shrinkage* which dates back to the 1930s. In Genoa, the period of urban shrinkage also dates back to the 1970s and 1980s when the city experienced the most significant losses of population.
- Some of the *postsocialist case study cities* had already started losing population before the beginning of the systemic change in 1989/1991 (e.g. Bytom, Makiivka, the historical part of Halle). The transition and its consequences have reinforced what by then had already been urban shrinkage-in-progress. In other East European case studies, the postsocialist transformation was the starting point of population decline. However, postsocialist transition has contributed to shrinkage in all the affected case studies; its effect was most severe during the 1990s. In some of the case studies, the population trajectory ‘resurged’ throughout the 2000s, returning to stable or even positive growth rates in some cases (e.g. Leipzig, Timișoara).
- *Almost all the cities under investigation will face further phases of population loss in the near future*, mainly as the consequence of ageing and a future decrease in household numbers (both long-term processes that cannot fundamentally be reversed in a short-term period).
- *All the cities vary in how their case of shrinkage relates to its national context*. Liverpool, for instance, has been the worst affected urban area in England’s North West, whilst the north west of England as a whole has remained to be one of the UK’s fastest shrinking regions. Genoa has appeared to be specific or a “forerunner example” in the Italian context due to its specific demographic situation stretching to a long historic period. Donetsk-Makiivka, Sosnowiec-Bytom and Ostrava, however, have all been typical of old industrial cities in the respective countries; with the whole country experiencing population loss since 1990. (This has especially been dramatic in the case of Ukraine).
- In all our cases, *urban shrinkage has progressed through phases of higher and lower dynamics*. There is a close relationship between the causes and the duration and severity of shrinkage processes. While Liverpool and Genoa had witnessed significant shrinkage during the 1970s and 1980s due to industrial decline, most of the east European case studies were affected by strong population losses as a consequence of post-socialist transition, primarily in the 1990s. Yet in the latter cases, suburbanization has remained to be more significant as an issue than in the cases of Liverpool, Genoa and Leipzig-Halle.

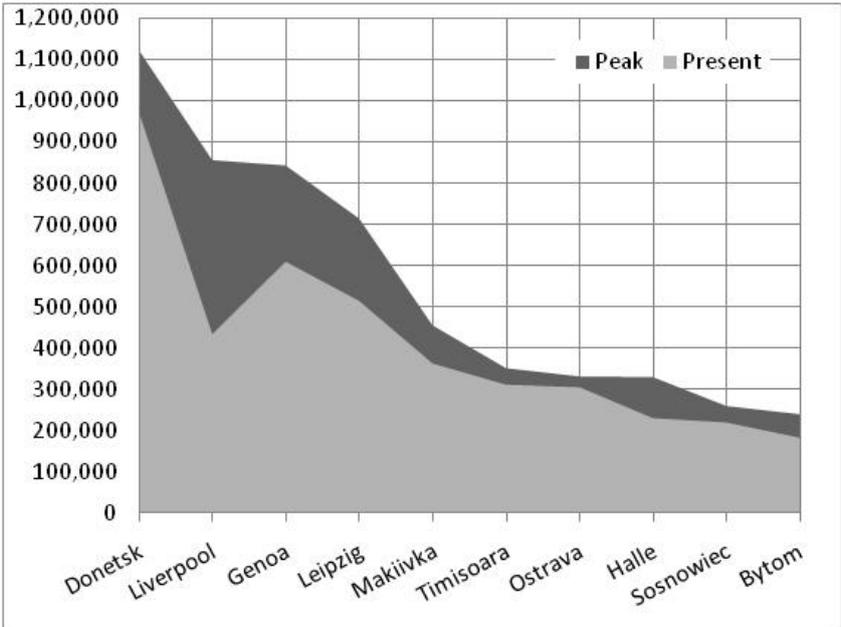
To conclude, it needs to be emphasized that the dynamics of urban shrinkage (e.g. its severity and persistence, see Beauregard 2009) have differed considerably within our case study sample. The same processes have been revealed in the long-term analysis of population development of Europe’s largest cities (above 200,000) by Turok and Mykhnenko (2007). Furthermore, in all our case study cities, *urban shrinkage has not had the same effect on the whole territory of a given city in an equal manner*. Often, either particular districts and their dwellers or particular areas of urban development have been especially affected or hit by shrinkage. We have observed both a spatial- and sector-related variance of shrinkage within the case study sample. In all the cases concerned, shrinkage has been spatially varied within the city. Often it was the inner city areas which have experienced shrinkage to the worst extent.

Figures 2, 3 and Table 1 compare the dynamics of urban shrinkage in the case study cities with respect to severity/scope and temporality. From the data it becomes obvious that although Liverpool had the biggest population losses in absolute as well as relative terms (420,000 inhabitants / 49 per cent), the most massive losses occurred in cities such as Halle (1.4 per cent annually), Bytom (1.1) or Makiivka (0.9). To put it differently: Although Liverpool, Leipzig and Halle appear to be the most hit by shrinkage in terms of pure population numbers, one should not forget that the tempo of shrinkage matters too (and a lot for policy purposes). In terms of annual % shrinkage Halle, Bytom and Makiivka are the those cities that are the most affected..

Most of our cities have lost some 10-30 per cent of their population although in very different periods of time varying from 20 to almost 80 years. All cases of long-term shrinkage reach high percentages of absolute (198,000-420,000) and relative loss (27.5-49.1 per cent). While three cities (Liverpool, Genoa, Leipzig) show a constant, significant population loss over a longer period of time (at least 40 years), most of the former state socialist case studies show a massive, rapid population loss after 1990 although some of them had lost population (at a more moderate level) already before (Bytom, Makiivka).

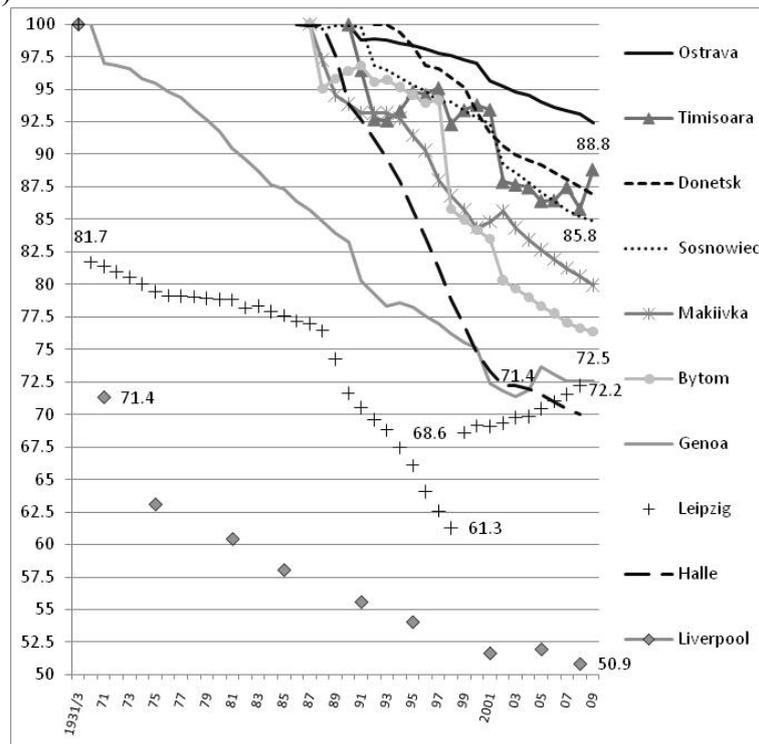
Future perspectives are differing: While cities like Halle, Donetsk, Makiivka, Sosnowiec, Bytom and Ostrava will see a continuous population loss also in the future, cities like Leipzig, Liverpool, Genoa, Timișoara will not loose population within the next years and even see a stabilization or slight growth. However, future periods of population losses, mostly in relation with ageing and a decrease in the total number of households are more or less probable in these cities, too. For the time being, one could obviously see, too, that Timisoara’s, Genoa’s and Leipzig’s population figures are on the upswing. Whilst Leipzig’s, Timisoara’s, and Genoa’s most recent upward trajectories look relatively impressive, Liverpool does look like not so successful in comparison; although there are signs of a ‘forthcoming resurgence’, the city population numbers do not seem show any sustained recovery up to present.

Figure 2: Magnitude of urban shrinkage: population figures at their peak and current levels in the case study cities



Source: SHRINK SMART WP2 D6 Database

Figure 3: The case study cities: descending population trajectories, 1931-2010, volume index (peak year = 100)



Note: Liverpool’s population peaked in 1931, whereas Leipzig’s in 1933.

Source: SHRINK SMART WP2 D6 Database

Table 1: The case study cities: Absolute population figures and percentage change, peak to current levels, ranked by total population decline

	Shrinkage period (peak to present)	Peak population	Present population	Annual % change	Total % change
Liverpool	1931-2008	855,000	434,900	-0.64	-49.1
Halle	1986-2008	329,625	230,900	-1.36	-30.0
Leipzig	1933-2008	713,470	515,469	-0.37 (-0.42*)	-27.8 (-31.5*)
Genoa	1970-2009	842,114	610,766	-0.70	-27.5
Bytom	1987-2009	239,800	183,200	-1.07	-23.6
Makiivka	1987-2009	455,000	363,677	-0.91	-20.1
Sosnowiec	1987-2009	259,600	220,400	-0.69	-15.1
Donetsk	1992-2009	1,121,400	974,598	-0.77	-13.1
Timisoara	1990-2009	351,293	312,113	-0.59	-11.2
Ostrava	1990-2009	331,219	306,006	-0.40	-7.6

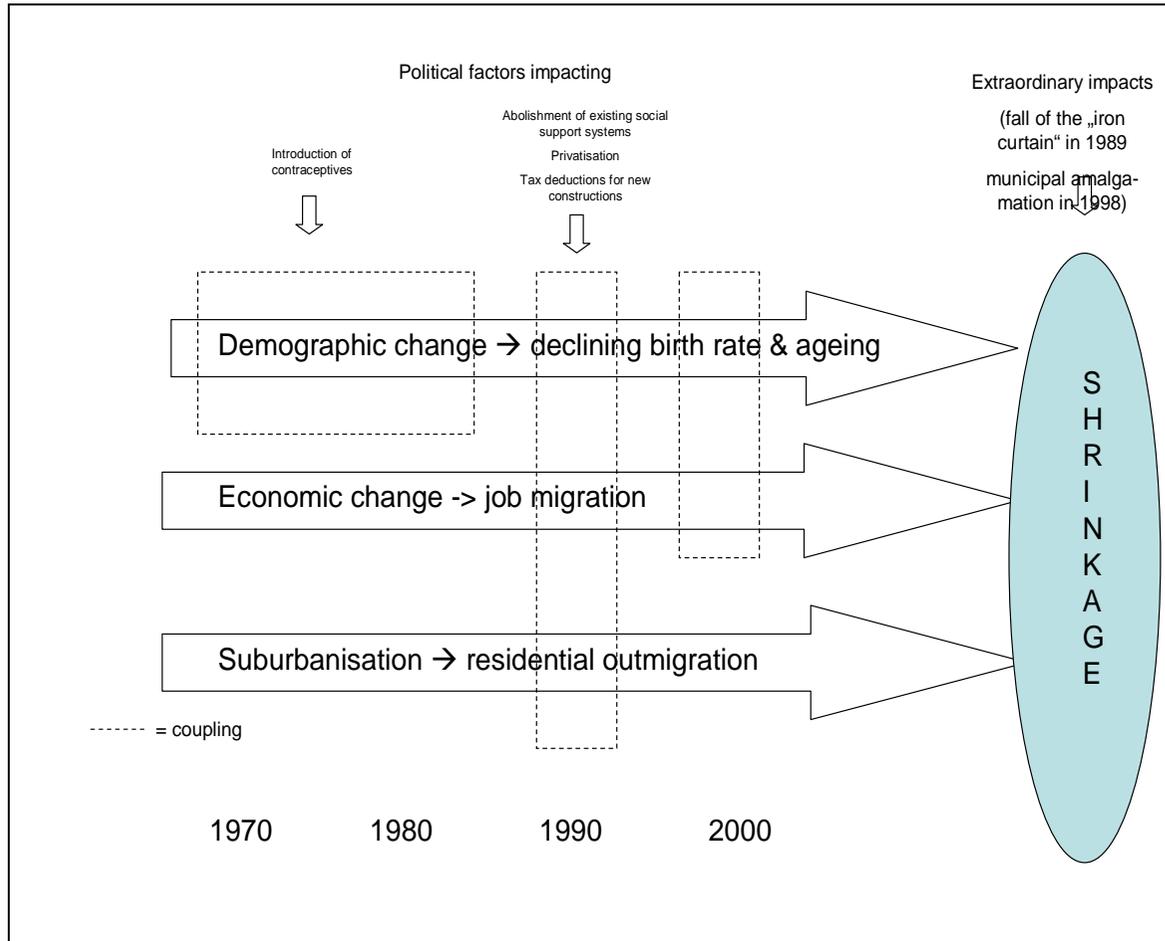
Note: * Estimated population decline figures within Leipzig’s pre-1999 city boundary

Source: SHRINK SMART WP2 D6 Database

A next step of analysis that seeks to combine the view on causes and dynamics of urban shrinkage modelling locally-specific trajectories is presented in Figure 4. We set the causes of shrinkage for the case study cities against their development and impact over time. Figure 2 presents the case of Leipzig as an example. The scheme is added by the storyline behind. While the arrows describe the causes of shrinkage, the dashed line boxes indicate their impact over time. For the presented case of Leipzig, it becomes obvious that while demographic change has had an impact on the development of shrinkage over the whole period of time observed, economic decline and job-related out-migration have played a role since 1990 and suburbanization fostered population decline mainly in the 1990s.

With help of these analytical steps, we relate our empirical findings from the seven case studies to the theoretical assumptions we started our project with. In the further elaboration of this paper, we will discuss in more detail how our findings relate to different models of urban development and strands of discussion on shrinking cities, e.g. concerning the historical dimension of shrinkage and the embedding of current processes of shrinkage into a wider framework (Lampen and Owzar 2008, Benke 2005), the causes and dynamics of shrinkage as well as its development and change over time (Beauregard 2009), the cyclic character and phases of shrinkage and how it relates to general processes of urban deconcentration and reconcentration/resurgence (Berg et al. 1982, Lever 1993, Storper 1995, Bontje 2001, Couch et al. 2005 and 2009, Haase et al. 2010) resp. to polarization of spatial development how Herfert (2002) describes it for eastern Germany or even perforation, a term that was created within the eastern German debate on shrinkage (Lütke-Daldrup 2001). In doing so, we want to better understand to what extent existing urban development models are appropriate to analyze urban shrinkage (Kabisch and Haase 2009).

Figure 4: Causes and trajectory of shrinkage in Leipzig: scheme and course of development



Source: authors' work

Leipzig reached its maximum population in 1933 with 713,470 inhabitants. Since this time, it has nearly always lost population. In the 1970ies the major reason for population losses was a negative natural population development which was at least to a part caused by declining birth rates as a consequence of the "baby bust" (introduction of oral contraceptives) in the late 1960ies. The resulting demographic imbalance was eased in the course of time as a result of pro-family politics supporting child bearing, but never completely lost its importance. As for the economy, Leipzig was one of the main industrial centres of the GDR and could thus attract in-migration, despite miserable living conditions and a problematic environmental situation. This only changed at the end of the 1980ies when fairly extraordinary political changes lead to the fall of the "iron curtain" and an immense wave of emigration started towards the West. Suburbanisation was next to impossible under the conditions of state-socialism and hardly played any role for the development of the urban population.

These conditions changed completely after reunification, and Leipzig experienced massive population losses as a consequence of declining birth rates, job migration and a roaring suburbanisation. These factors led to by a dramatic decline in population and until 1998 Leipzig lost almost 100,000 of its inhabitants. In the first half of the 1990s, 20,000 more people died than were born. In 1995, a Total Fertility Rate of 0.77 children per woman was measured in eastern Germany, which presented the world's lowest value.

As a consequence of German monetary union and the subsequent privatisation, Leipzig's economic basis was substantially damaged and until the mid-1990s Leipzig's industry alone lost 80,000 jobs. As deindustrialisation was accompanied by "de-administration" (liquidation of administrative structures) the result of these simultaneous developments was an immense loss of jobs, which have not been able to be absorbed by new developments up to now. This miserable economic situation stimulated a migration to more prospering regions, mainly in the West of Germany. Moreover, in the first half of the 1990s, a massive suburbanisation process started too, which was extensively stimulated by state subsidies for new constructions. The main period of suburbanization was short; it lasted from 1994 to 1997. From 1996 to 1998 almost 30,000 people left Leipzig for its surroundings. As tax deduction schemes ended in 1998, suburbanisation considerably lost momentum at the end of the 1990s.

Altogether, Leipzig thus experienced a simultaneous impact of demographic change, job-migration, and suburbanisation that was to a large degree an outcome of the very specific way of postsocialist transformation in the German context. It should be emphasized that the specific coupling of driving factors to shrinkage had an immense impact on age-structures too, as both suburbanisation and job-migration were dominated by young households thus reinforcing the aging of the remaining population.

The administrative reform of 1999/2000 led to a considerable increase in the number of inhabitants. Since that time, Leipzig has seen a continuous growth of its population. In 2005, the city crossed - again - the border of 500,000 inhabitants and stopped shrinking. Besides in-migration, this was due to an increase which, nevertheless, very low with 1.2 children per woman (2007). The number of deaths exceeds the number of births, which brings about a negative balance of the natural population development.

The economic situation remains miserable and is reflected in high unemployment rates and low wages. Despite some successes in attracting new investment, Leipzig thus continues to lack the economic basis for attracting new immigration or keeping its residents, especially after these finished their educational training.

Suburbanisation has nearly completely stopped and been replaced by a new in-migration from adjacent municipalities including a 'back-to-the-city' movement of some suburbanites who left the city in the 1990s, or their children, for educational or professional purposes. This has led to a slightly positive migration balance of the city and its hinterland in recent years.

3. Impacts of urban shrinkage

Overview

Comparing the nine observed cities with regard to the impact of population losses is everything but an easy endeavour. Though it would be a correct statement to say that population losses have had a severe and, sometimes, even dramatic impact on most sectors of urban development in all the cities concerned, comparing the actual impacts in different cities is a complex issue. The main reason for this is that there has not always been a clear causal relationship between population decline and the issues of social cohesion, economy, housing, technical and social infrastructure, and municipal budgets. All these arenas of urban development have been also influenced by other factors, like the degree of social polarisation, a particular economic structure, the urban form, and (supra-)national and regional regulations; as a consequence, it has often been impossible to isolate the impact of shrinkage from other influential factors and intervening variables. Moreover, the particular course of urban shrinkage has played an immense role: Has shrinkage happened over a long time or has it had a form of an abrupt change? Has it affected the whole city or only some parts of it?

As the result of this complexity, a comparison cannot provide a comprehensive explanation for the impact of population losses that would match every city in the sample. It can, however, highlight the features that have been most common among the cities under investigation and discuss some factors that are crucial to the developments concerned.

As the *overall comparison* reveals, the impact of shrinkage has been most clearly visible in the spheres of social infrastructure and land use. While similarities exist in other fields of urban development as well, they have either been not as strong, or the developments have not as clearly been the result of a population loss. As population losses tend to influence urban development in different ways and the outcome has been different among the cities under investigation, we have refrained from producing a 'one size fits all' kind of over-generalization, rather opting for a discussion of *typical* impacts of shrinkage on different arenas of urban development.

It is contended the urban shrinkage is not automatically related only to negative impacts. While, in some cases, it has been accompanied (or preceded) by disinvestment, an outflow of economic and human capital, as well as a deterioration of housing and living conditions, in other cases, population loss has led to a certain relief in the tight housing market (e.g. in the former state socialist case studies, except for Leipzig and Halle) and to a de-densification of the inner city residential areas (e.g. in Genoa). In most of the case studies concerned, deindustrialization has led to an improvement in the quality of natural environment, a decrease in environmental pollution and degradation, and an increase in the green urban space.

The following survey in Figure 5 shows the impact of urban shrinkage on particular spheres of urban development as they were elaborated in the WP2 D4 reports. By assigning different colours to the specific table boxes, we have differentiated between a) the type of impact that is clearly related to urban shrinkage, b) the type of impact which is unclearly or ambiguously related to urban shrinkage, c) whether there has been no impact at all, and, finally, d) the cases where we still need more knowledge to make a concluding assessment (see legend below).

Figure 5: Impacts of urban shrinkage

	<i>Liverpool</i>	<i>Leipzig/Halle</i>	<i>Genoa</i>	<i>Timișoara</i>	<i>Ostrava</i>	<i>Bytom/Sosnowiec</i>	<i>Donetsk/Makiivka</i>
Segregation and social cohesion	shrinkage has occurred as the same time at the core city has gentrified.	ambivalent effects, out-migration of middle classes, due to opportunities of loosened housing markets at the same time downward effect for disadvantaged neighbourhoods; as a result, poverty and vacancies became interrelated	immigration as an indirect consequence of shrinkage and ageing, leading to an increase in ethnic and social segregation	unclear whether existing socio-spatial differentiation is related to urban shrinkage; suburbanization is carried by middle classes and better-off households (?)	social exclusion (combined with ethnic exclusion); in some areas unemployment is far above average strong interrelation between problematic living conditions (i.e. proximity to polluting industries) and poverty/ exclusion, especially w. respect to Roma	social exclusion in poor-quality workers settlements; here highest unemployment rates up to 50%	increasingly uneven urban development with respect to the urban district level
Business and employment	shrinkage occurred at the same time as the number of jobs in the core city declined - after 1991 when there was a net gain in (mainly service sector) jobs, the rate of shrinkage slowed	deindustrialization led to high and long-term unemployment	(?)	(below-average unemployment (in 2000s below 4%); improvement of GDP per head)	unemployment developed in accordance with the overall economic situation of the country, although being above the average	unemployment above the average; high share of long-term unemployed	uneven development in Donetsk and Makiivka shift from industry to service sector in Donetsk lack of alternative development in Makiivka
Social infrastructure and educ.	closures of schools	closure of schools and kindergartens	decreasing demand for nurseries and schools; stabilization in the 1990s, partly due to foreign immigration	closures of kindergartens and schools, decrease in number of children attending/newly enrolled	decreasing enrolment in schools and kindergartens	decrease in pupils, especially in primary schools	dramatic breakdown in demand for and use of social infrastructure for children; decrease in numbers of pupils
Housing	housing shortage in 1971 changed into surplus after 1991 (result of falling household numbers and slight rise in housing supply) no dramatic vacancy rates, even in times of shrinkage as the result of continuous demolitions, housing market never mismatched	vacancies are the most visible and dramatic impact of shrinkage, leading to physical decay, economic problems and perforation of settlement structures	housing vacancies are a problem (11 per cent in 2001) at the same time, aging and individual ownership lead to under-usage, thus absorbing the potential oversupply	national housing constructions stopped after 1990 recently new programmes (?)	the slight population decline did not cause dwelling vacancies but enabled the improvement of living conditions through the growth of dwelling space per person	housing situation generally improved due to the severe housing shortage	decrease in housing demand decline 'eased' the shortage problem

Technical Infrastructure	(no evidence; further research needed) (?)	falling demand for water and wastewater, met by an expansion of the grid change in the modal split towards individually motor car transport	impact of shrinkage in car traffic ('relief')	<i>number of trams, trolley buses and buses decreased after 2005, however it is not clear whether this is due to population decline; number of passengers in decline until 2006, then increasing afterwards</i>	<i>traffic: the biggest problem is rising number of motor cars</i>	<i>closure of some tram and bus lines due to falling demand, both as the consequence of increased car traffic and use or shrinkage</i>	<i>impact on water supply, central heating, and gas network, but not very straightforward</i> <i>demand and supply of water and the discharge of wastewater have dramatically declined</i>
Land use and environment	expansion of brownfields although their percentage is today lower than in the 1980s deindustrialization had a positive effect (organic load of the Mersey estuary)	vacant properties, perforation of settlement structure; deindustrialization led to the expansion of brownfields deindustrialization had a positive effect (less air pollution etc.)	<i>brownfields until the 1990s, then revitalization of historical city centre and waterfront brownfields</i>	<i>emergence of brownfields as a result of the closure of industries; partly reuse as commercial areas and new business locations</i>	brownfields/ 'blackfields' in close neighbourhood to the city centre and residential districts	environmental degradation and brownfields as a big problem	deindustrialization had a positive effect on the environmental conditions deindustrialization and closure of mines/enterprises led to the expansion of brownfields, especially in Makiivka
Municipal finances	(further research needed) (?)	declining revenues, growing expenses; dependence on external funds	growing public debt, since only one half of municipal revenues comes from taxes and tributes → dependency on national and regional transfers	<i>municipal budget: share of own income increased from 2005-2009 (less dependent)</i> <i>use of external funds (EU, bilateral projects etc.)</i>	<i>decline in number of inhabitants between 1989 and 2009 did not play any significant role on the positive development of budget</i>	modest budgets, are burdened by indispensable expenditures	<i>municipal budgets closely related to/dependent on residents' income and industry</i> <i>Donbas suffers from central government transfer system</i> <i>(being a donor region at the national scale)</i>

Source: authors' work

Figure 5 legend

Xx (?) In need of more knowledge

(Xx) No impact

Xx Impact is related to urban shrinkage

Xx Not clear whether an outcome of shrinkage, or other processes/ ambivalent impact/ contrary to trend or expectations

Arenas of urban development

Impacts on segregation and social cohesion

Though the challenges of segregation and social cohesion are undeniably a common feature for all the cities under investigation, studying its causes and its developments have legitimately been one of the most difficult subjects of urban sociology. Whilst it is possible to correlate segregation and shrinkage, it is much more difficult to establish a causal relationship. This holds true for most of our case studies. The reason for this is that both urban segregation and cohesion are strongly influenced by class- and age-patterns, property structures, the urban form, cultural factors, political regulations, and economic developments; the combination of these changes has varied from time to time and from place to place. The development of segregation and social cohesion, thus, could not be reduced just to a single factor like population loss. However, in the most cases under investigation we have identified the three following key interrelations between urban shrinkage and segregation.

In terms of segregation characteristics, hardly any evidence was found, that population decline in cities has had an impact on residential segregation. Nevertheless, there are plenty of cases, where the population loss has had a lasting impact on the socio-spatial differentiation of certain areas and shaped the social, demographic or ethnic fabric of neighbourhoods. Moreover, urban shrinkage seems to have brought about a specific dynamic to the scope and development of socio-spatial differentiation, for instance:

- In the *former socialist countries*, social segregation was generally at a lower level than in western countries but has increased during the transition period; both, processes of shrinkage and socio-spatial differentiation went hand in hand and resulted in a higher but in comparison to western countries still moderate degree of segregation; there are some signs of exclusion of better-off income groups in cottage villages and gated communities (e.g. in Donetsk, see Mykhnenko and Swain 2010, 153-154, and Timișoara) forming small “pockets of wealth” at the fringe and of a concentration of disadvantaged groups in some inner-city, old built-up districts of the cities. In almost all our postsocialist case study cities, these processes have gained dynamics during the 2000s whereas there had been still less pronounced during the 1990s.
- Shrinkage in *Liverpool* has occurred at the same time as the core city has gentrified. This means that the conurbation’s higher socio-economic groups are more concentrated in the core city today than in 1991. There is also little doubt that the housing market in Liverpool (and many other UK cities) is more spatially socially segregated today compared with two decades ago, but this cannot be directly related to shrinkage. Shrinkage possibly supported the rapid dispersion of immigrants throughout the city due to a higher accessibility of many neighbourhoods with respect to vacancies and a housing market dominated by oversupply.
- In *Leipzig*, one could observe an increasing housing mobility during the peak of oversupply leading to a more rapid rearrangement of the social make-up of many inner-city neighbourhoods. In some cases, there was an almost total exchange of the residential population bringing about rejuvenation and a highly diverse age, household, educational and income structure.
- In *Genoa*, out-migration and decay led to the concentration of elderly and the underuse of housing in the historical inner-city (middle-class) districts and where these abandoned sites. At the same time, dilapidated inner-city areas with vacant flats have served as niches for migrants to concentrate since the 2000s.
- In *Ostrava*, new housing (for middle and upper middle class demand) has been built on all types of unused land, be it brownfield, greenfield or even ‘blackfield’, pulling these residential groups out of other districts, such as the inner city or large housing estates, where the less affluent are left behind (i.e. social de-mixing).

Firstly, urban shrinkage has often been combined with suburbanisation, i.e. the expansion of the housing stock in the form of single detached, semi-detached, terrace or holiday houses on the fringes of a city (a very prominent development in Liverpool, Leipzig-Halle, Genoa, and Ostrava). As this form of suburbanisation is regularly focused on middle class families it has led to an outmigration of better-off social groups, consequently reducing their tax share in the neighbourhoods of original residence. As a result, the social mix in these neighbourhoods has changed, leaving poorer parts of the population behind and leading to a relative increase of disadvantaged social groups in the overall population of the city.

Secondly and partly connected to suburbanisation, declining housing demand and out-migration away from inner-city areas have opened up new spaces for new in-migration, including foreign immigration. Depending on the particular qualities of the urban area, the emergence of housing vacancies could thus be a starting point for the social transformation of the neighbourhood and its re-use by others than the original inhabitants. This can take the form of 'studentification' and gentrification (like in Leipzig's Südvorstadt or central parts of Donetsk), or lead to ethnic segregation, the concentration of low income and other disadvantaged households, and the emergence of places where physical dilapidation coincides with the concentration of particular residential groups and/or with social exclusion (e.g. Ostrava's Roma settlements or Genoa's inner city districts with high shares of low-skilled migrants).

Thirdly, the decline of traditional industries can cause a loss of social status for the workers that have been previously employed in these parts of the economy. As the less skill-intensive industries like mining or port industries have been among those that were regularly most hardly hit by economic changes, it was not surprising that their employees have often lacked the appropriate skills necessary for developing a new career in the service sector. Thus, even if there has been an economic transformation, providing enough new job opportunities (which has not been the case in many of our case studies), often the disadvantaged parts of the population were left (far) behind. When the disadvantaged have concentrated in particular neighbourhoods, the aggregated urban consequence of industrial decline has acquired an 'elevator-like effect', in which the social status of a particular urban area goes down as a consequence of the declining social status of its inhabitants. The affected neighbourhoods have experienced a rise in unemployment and poverty. In this situation, they have lost their affluent residents due to out-migration, either in search for jobs outside the region or due to suburbanization that occurred in parallel. Without high pressure on the housing market, no other affluent households have managed to fill the gap so far. Prominent examples of such developments have been poor-quality mining workers settlements (e.g. in Bytom, Donetsk-Makiivka, and Ostrava).

In reality, one has most often found a combination of these factors, so that it has been difficult to distinguish the causes leading to the intensification of segregation and the expansion of socio-spatial exclusion. The impact of urban shrinkage represents just one of different causes and triggers which result in socio-spatial segregation. The assessment remains complicated: on the one hand, housing surpluses and moderate rent levels had increased the choice of housing relocation opportunities for a relatively broad range of households, e.g. in Leipzig and Halle during the 1990s and early 2000s; nevertheless, the long-term effect of housing surplus in later phases of housing market consolidation under the conditions of shrinkage has resulted in a stronger segmentation and segregation in the same areas from the early 2000s onwards. In other places, segregation has developed partly as the indirect consequence of shrinkage, since the most excluded group, the Roma, were left behind in areas heavily damaged by the 2002 floods as the residual inhabitants of rapidly depopulating areas.

Impacts on business and employment

According to standard new and evolutionary economic geography models, a fall in productivity resulting in a decline in profits, business failures, loss of jobs, and the subsequent out-migration have long been recognised as a series of cumulative causal factors leading to a spatially distinct pattern of population decline. The gradual decline of the imperial trade routes via the North Atlantic since the end of the Second World war and the so-called structural adjustment which the industrially advanced Western economies in general have experienced in the late 1970s onwards ought to be regarded as the two primary economic causes of urban shrinkage in a vast majority of west European cities. Set against this background, the specific economic structure of a city played an important role for its capacity to cope with structural changes. To illustrate that, the example of Liverpool and Bristol might be meaningful: Both are west-coast ports in the UK. While Liverpool suffered massive decline in the 1970s and 1980s, Bristol did not. This was, in part, due to its different economic structure, with a much higher representation of aero-space and defence industries and service employment than Liverpool. However, there are many other factors influencing economic performance, including location, accessibility, leadership, skills-base, environment, etc.

A similar process of economic transformation, which has led to widespread deindustrialisation and a decline in output and employment following the fall of state socialism in Eastern Europe and the former USSR, has been a central cause of shrinkage of postsocialist cities as well (see Birch and Mykhnenko, 2009; Mykhnenko, 2009).¹ The same is true for Ostrava. An additional challenge for the affected cities in those regions was the fact that economic restructuring occurred at a time when the whole political and institutional setting at the national and local scale had to be re- or newly arranged. Especially affected were mono-functional cities: A decline in coal-mining – whether market- or state-enforced – has had a profound detrimental effect on the economic trajectory of Donetsk and Makiivka as well as Sosnowiec and Bytom, and has triggered the processes of urban shrinkage in at least the latter part of the conurbations each. Timișoara with its more diverse economic basis was much less affected by economy-related shrinkage.

Our sample of cities is a case in point to confirm these general assumptions. According to our case study analysis, economic downturns, recessions, and crises of traditional industries have been in most cases one of the main drivers of shrinkage. Generally, they have occurred earlier and over a longer time-span in the western cities like Genoa and Liverpool, but more intensively and over a very short period of time in the former state socialist countries. In Liverpool e.g. which represents a typical case of decline of an old industrial city, the decline of basic industries (the port etc.) in Liverpool led to a fall in the number of jobs and job-related out-migration. This process was at its strongest in the 1970s and 1980s. This population decline, coupled with the reduced spending power of the remaining population led in turn to the decline of non-basic industries (schools, shops, etc.), further job-loss and further job-related out-migration. In case of the former state socialist economies, the common consequences of industrial breakdown were a downturn of employment opportunities, job-related outmigration and an immense increase of unemployment and poverty. Sometimes, the whole job market collapsed with the exception of the public service sector, and the cities faced the phenomenon of structural unemployment (Leipzig/Halle, Bytom). There is no one-dimensional relation between population decline and a rise in unemployment: It is e.g. possible to imagine that shrinkage based upon demographic change, or shrinkage based upon suburbanisation might not have this inevitable impact. Or, as the case of Donetsk and Makiivka, for example, shows,

¹ In some of the old industrial state socialist cities like Makiivka and Bytom, economic decline and urban shrinkage had generally begun long before the start of economic transition in the late 1980s – early 1990s, population decline was triggered by a gradual demise of traditional primary industries.

unemployment and poverty do not have any assessable impact on urban shrinkage since both cities have been amongst the fastest shrinking urban areas in Ukraine, despite being characterised by relatively lower rates of social deprivation than the country as a whole. In Timișoara, during the 1990s, many people out-migrated for seasonal jobs abroad but not because of being unemployed but because of rising poverty and the need to make ends meet for their family.

Furthermore, it seems that an economic downturn, especially, if it reaches a full-blown depression scale, has an adverse impact on the birth rate: more directly in alienating young people and increasing their uncertainty about future, indirectly through the outmigration of young people, in particular, young women (most prominently, in Donetsk-Makiivka). Subsequently, youth unemployment has appeared to be a cause of shrinkage. The outmigration of well-educated young people represents in some of the cases a form of a brain drain (e.g. in Genoa and Ostrava). The cities undergo in most cases a phase of high unemployment (in Leipzig and Halle the rates exceeded 20 per cent), although the development of unemployment relates also to other, global impacts, e.g. international economic or financial crises. In some cases, high unemployment leads to an increase in poverty rate, too, like it was the case in Liverpool during the 1980s and is still the case in both Leipzig and Halle since the 1990s. Ageing represents an additional constraint in most of the cities since it leads to a rising share of economically inactive population.

From this common starting point (albeit on a different time scale) some cities have managed to recover with their original industries (Donetsk), some have managed to attract new industries (often on the basis of low wages and subsidies, like in Ostrava and Sosnowiec), and still others have – more or less successfully - managed to change their economic profile into the direction of a service economy (Genoa, Liverpool, and partly Leipzig and Halle). However, most cities have not yet completely recovered from the losses, so that the disruption of the original economic basis remains to be a burden. This becomes obvious mainly by the fact that economic restructuring in most cases has brought about an absolute loss of jobs (see Birch and Mykhnenko, 2009). It is characterized by a shift from a previously dominating industrial sector to the service sector too, leading to certain structural consequences for the labour market, primarily a mismatch between the available qualifications among the local labour force and those in demand. In some cities like Liverpool and Leipzig, the local GDP has continued to remain below the national average and in Genoa below the regional level of northwest Italy, whereas in the eastern European cities, such a relation has not been confirmed. Donetsk and Makiivka exceed the national average of GDP because of their (continuing) role as the most important industrial hub of Ukraine; Timișoara and Ostrava were able to maintain or even re-improve their position with help of successful re-industrialization processes. Yet even re-industrialized cities like Timișoara or Sosnowiec have failed so far to generate enough qualified and well-paid jobs in new branches like IT or biotechnology to offset the jobs lost in mining and manufacturing. Another prominent feature, especially, in the newer eastern EU member states has been the takeover of local businesses by foreign investors (for more detail, see Drahoukoupil, 2009). This means that east European cities represent, in a sense, extended workbenches (low-wage based production of western firms in former state socialist countries) or overseas assembly platforms of foreign multinationals typically characterized by low-wage jobs, loose capital and high dependence from and vulnerability towards processes and shifts on the global markets.

There is a differentiation between Western and Eastern Europe: some of the East European cities within the sample continuing to orientate their development towards heavy industries, whereas West European cities try to orientate their economy to the service sector. Nevertheless, the restructuring of the labour markets has had tangible impacts on specific social groups: whereas the younger, better-educated people are able to join the service sector, the older people with qualifications in industries are not able to gain new rewarding employment

opportunities; hence a higher rate of unemployment in these groups, a rise in poverty and a renewed threat of future impoverishment too. Some cities have institutionalised an active labour market policy by bringing young or unemployed people via specific training and education programmes into particular branches of the IT or service sector (e.g. in Leipzig, Timișoara or Genoa where after massive job losses during the 1980s there was a recovery in jobs in the low-paid service sector from the 1990s onwards). The biggest decline in Liverpool, Ostrava, Timisoara, Leipzig was in port-related and/or manufacturing employment. Recent growth, albeit not at all places strong but at many only modest, has been in the service sector (see also Couch et al. 2009).² Furthermore, some of the new industries are located on the fringe of the cities concerned and have the potential to accelerate the abandonment of the core urban areas and the emergence of new brownfields (e.g. in Genoa and Sosnowiec).

As economic fortunes of presently shrinking cities may eventually turn for the better either due to effective public intervention and sustained regeneration efforts and or newly-found private market activities, economic processes could have a positive impact on shrinkage, potentially stopping and reversing migration flows and the overall demographic trends (e.g. Liverpool and Timișoara). Labour markets in shrinking cities can benefit from national economic upswings, too. The Donetsk labour market, for example, grew during the resurgence of the urban and national economies in the Ukraine in the 2000s up to the beginning of the global financial-economic crisis from 307,800 employees in 2002 to 353,600 in 2008, whilst Makiivka saw a more modest upswing from 83,000 employees in 2004 to 86,300 in 2008. In Timișoara, to mention another example, population decline caused a lack of labour force for newly-emerging service and IT sector enterprises in the period of economic recovery in the second half of the 2000s.

Generally, it has to be stated that economic processes represent causes for shrinkage too, and that it is fairly difficult to distinguish between their role as causes and impacts. Moreover, the comparison of the case studies shows a somewhat diverging picture. This issue has to be discussed further.

Impacts on social infrastructure and education

Concerning social infrastructure, there are two issues that matter in all the case study cities: while all cities have witnessed a decrease in the figures of school pupils and children enrolled in kindergartens and had to downsize, close and adjust the existing social infrastructure, ageing has led at the same time to a rising, specific demand for new infrastructure for the elderly. Urban shrinkage and selective out-migration have resulted, subsequently, in a very selective decrease or increase in demand for different sorts of child and personal care provision. Shrinkage, thus, has become a clear challenge for the established social infrastructure.

In almost all of our case study cities, there are two factors that have led to declining numbers of children and, as a consequence, declining numbers of enrolments in kindergartens and schools: on the one hand, it was the low birth rates over a longer time and, on the other hand, it was population decline and, particularly, the selective out-migration of young people. As we have already argued, this combination of two factors was discovered in all our case study

² “The analysis of employment growth between 1998 and 2007 in Liverpool identifies two key growth sectors: firstly, banking, finance and insurance where jobs increased by 47.1%; and secondly public administration, education and health where jobs increased by 25.7%. Over the same period the most significant decline was in the manufacturing sector continuing a much longer-term trend. By 2007 only 5.2% of jobs in Liverpool were in manufacturing; in contrast 60.8% of jobs were in the two key growth sectors (Annual Business Inquiry Employee Analysis). These trends suggest a geographical redistribution with employment growth focused particularly in the city centre.” (Couch et al. 2009)

cities. Subsequently, the decline in demand for places in kindergartens and schools represents a direct consequence of population decline, specifically, concerning certain age groups and household types.

In some of the case study cities, a number of kindergartens and schools have had to be closed already as a consequence of falling demand (Bytom, Leipzig, Halle, Liverpool, Timișoara, Donetsk, and Makiivka). In some cases, the closure was realized through a merger of two locations better to correspond with the existing demand (e.g. Leipzig, Timișoara). But the closure of kindergartens and schools has not been an indispensable consequence of decreasing numbers of children everywhere. In some cities, the falling demand by ‘native’ inhabitants was balanced by a rising number of children amongst new immigrants (Genoa, partly also Leipzig). Furthermore, even in the cities that have had a significant decrease in the number of pupils, the impact on urban development has not been the same in each case. Similar to the housing sector, we have observed a huge difference between dense cities and those that have (enough) space. While for the former, the post-1989 shrinkage has even represented a solution for the existing lack of facilities (Timișoara), for the latter it has soon turned out as an over-supply problem (Leipzig). Therefore, decreasing school and nursery enrolment does not necessarily have to be answered by the downsizing of infrastructure. Nevertheless, falling numbers of pupils alongside with stable running costs of schools lead to rising costs per pupil. In case of school closures or mergers, transport costs increase due to longer travel-to-school distances. In the case study examples, this has a direct effect on the local budget, when school infrastructure or public school transportation is locally financed.

At this stage of the research, it is hard to evaluate the real effect of the closure of kindergartens and schools for the attractiveness of residential neighbourhoods. But in Leipzig and Timișoara and Genoa e.g., of all the case study cities that had to deal with school closures, the concerned inhabitants strongly feared a downgrading of their quarter. At the same time, and especially in those areas where schools or kindergartens work together with other local institutions (neighbourhood libraries, senior residences or youth clubs), closures have had a negative impact on the social life, cohesion, infrastructure within those neighbourhoods. Nevertheless, a merger of schools in two different neighbourhoods may provide a chance to counteract effects of segregation. It may lead also to conflicts between the interests of different social groups with respect to the quality of education and social company of their children. In Donetsk and Makiivka, e.g., often, private residential choices in the conurbation are characterised by some in-built inertia involved concerning the travel-to-work distance, the social composition of the neighbourhood, the quality and affordability of housing, the natural environment, and the availability of basic retail amenities. Pre-school care and education do not appear to feature prominently amongst the factors involved, as the affluent and middle class inhabitants tend to drive their children to the nurseries and schools of their (first) choice, whereas the low-income and working class urban dwellers usually reside in affordable housing, notwithstanding the quality or availability of child care and educational options. There is a lack of evidence to suggest that the existence of a local kindergarten would improve the attractiveness of a neighbourhood per se.

The other side of a changing nature of demand is the growing need of services for the elderly. In all of our case study cities, the aging of the population has led to a growing demand for medical and personal care services necessary for senior citizens. Whether or not this demand is met depends on the economic situation and the welfare system of the particular country. In Genoa, for example, the fact that a part of elderly care is organized in that way that their families get care vouchers maintains a demand for migrants (mostly female, from Latin America). Thus, whereas the number of doctors has increased tremendously in Leipzig and life expectancy is at a historical peak, the disintegration of the state- and company-funded welfare systems after the fall of the Soviet Union has resulted in a crisis of public health and a dramatic

fall in life expectancy in Ukraine. The lack of an effective publicly-funded personal care for the elderly, combined with Ukraine's fairly low basic state pension provision, has led to a dramatic rise of poverty amongst the population above the working age. Nevertheless, with the average age in the Donetsk-Makiivka conurbation reaching well over 40 years, it is difficult to identify some particularly young or old neighbourhoods as such to foresee any age-related segregation development. A notable exception has been the gentrified areas of the two cities with some particular natural environment attractiveness, where the original elderly poor inhabitants have been replaced (though natural turnover and/or sale of housing land plots) by the more affluent city dwellers.

Housing

As with other place-bound infrastructures, housing is severely affected by population losses too. When population numbers drop, less demand is available for the existing housing stock and the consequence are often falling rents and housing prices, and a cut in real estate investments and residential vacancies. The effects of this are highly problematic – both for the property owners and for the affected neighbourhoods. Thus, a lack of maintenance, personal and property safety issues, and perforation of the urban fabric have proved to be among the major - visible to everyone – problems in the old housing neighbourhoods. Profit losses, the devaluation of vacant sites, lower house prices, depreciating mortgage values, and greater marketing expenditures have become the keywords which describe the effects on real estate markets in shrinking cities.

Although these consequences are theoretically unavoidable, we have only found one case, Leipzig/ Halle, in which high vacancies have an obviously problematic impact on urban development. The reason for this is that the effect of population losses on the housing market has been balanced by the following three developments that lead to a reduction in vacancies:

- a) In many Central and East European countries housing markets have historically been characterized by extreme shortages both under state socialism and afterwards. As a consequence, population shrinkage occurs under the conditions of excessive demand as the dominating factor and some relaxation of this situation is rather welcome. Suburbanization has thus reduced the problem of housing shortage in the cities for certain residential groups, but at the same time contributed to a rising gap between up- and down-market developments. While the state-led housing construction has stopped or continues on a very low level, private investment in new housing construction nearly exclusively targets affluent, upmarket demand. There is a shortcoming of moderate-priced flats for medium and low income groups. Though vacant housing co-exists with a strong demand for housing in some cities this is primarily due to disinvestment, poor maintenance and bad its unsatisfactory technical conditions such as physical dilapidation and post-mining and flood damages, e.g. in Bytom and Ostrava. The low demand slows down both the renewal of old housing stock and the building of new housing. The current economic and financial crisis makes the situation more complicated because many building projects were stopped and will probably not be finished (e.g. in Donetsk).
The fact that population decline led to a relaxation of an overcrowded housing markets applies also for Genoa's inner city. While there is a demand surplus with respect to moderate-priced flats for middle class families and social housing for low-income households, there is a oversupply with large, upmarket housing.
- b) Demographic change and aging have led to smaller households in all of the cities concerned. As housing demand is not completely elastic, smaller household sizes lead to a higher per head consumption of space, so that less inhabitants use more dwelling space, e.g. in Genoa. Here, the process of ageing combined with private individual ownership

have resulted in the under-usage of many flats, mostly in the inner city, which hitherto has absorbed the potential supply surplus of housing in the city. Typically this takes the form of the elderly residents staying in large apartments after the grown children have left the nest.

- c) The state can counter the situation by actively reducing the oversupply of housing by the means of demolishing vacant apartments. This has been done in Liverpool for decades via the clearance of industrial sites and vacant poor quality housing areas, and the construction of low density housing to address the needs of middle class residents).³ Demolition of vacant housing has also been one of the main tools in recent urban development strategies in eastern Germany (though the state-funded demolition of surplus housing, mainly in large housing estates on the fringes of the cities). Whereas in Leipzig and Halle contradictory processes after 1990 (out-migration on the one hand, and newly-built housing as well as the renovation of the old building stock on the other hand) have led to a massive oversupply of housing, which caused the introduction of a federal government programme subsidizing demolition.

Generally, shrinkage does not inevitably lead to the emergence of housing vacancies. Their emergence depends on what proportion of housing is allocated by the market. In market allocated housing, vacancy depends upon the interaction between supply and demand. Even in a declining population (e.g. Liverpool) it is possible for the population to have a rising income that can support more housing occupancy. Also in a declining city the price of housing is likely to fall, so increasing its occupancy. Nevertheless, there does seem to be a correlation between shrinkage and vacancy, especially in social housing areas, and especially in the short-run, before the market has time to react. In the former state socialist cities, population decline has led to a “relaxation” of crowded housing areas and reduced surplus demand as mentioned above. A housing vacancy may in these cities shortly occur as the result of unclear or undefined inheritance rights after death of the owner-occupier, yet it is sometimes turned into social housing by the local council authorities to accommodate low income city dwellers (e.g. in Donetsk and Makiiivka).

Housing vacancies in some of our case study cities are closely connected to dilapidation and decay of the urban fabric, e.g. in Genoa, Bytom or Liverpool. In Leipzig and Halle, a specific of the supply surplus market consists in the fact that a part of the vacant stock is completely renovated.

The consequences of housing demolition ought to be tracked further: in the cases of Leipzig, Halle and Liverpool, housing demolition has led to a more balanced housing market; yet, at the same time, it has generated new imbalances since the focus has been either on the high rise blocks of flats in large housing estates (Leipzig, Halle) and low-standard working class housing (Liverpool). In both cities, housing vacancies and demolitions have led, moreover, to a change in land use, housing density and settlement structures: while demolitions in Leipzig and Halle have reinforced the perforation of the urban grid, new build housing in inner Liver-

³ Whilst it is true to say that in the case of Liverpool, demolitions have led to a more balanced housing market, the changes were specific to certain parts of the city and certain programmes. The past three decades have seen a process of re-orientation of housing supply to meet contemporary market demand rather than any overall reduction in supply. The number of dwellings in Liverpool actually *increased* slightly from 193,210 in 1971 to 197,824 (+2.4%) in 2001. However this overall increase masks quite large scale demolitions, mainly of social housing, especially high-rise apartments, in a) the inner urban areas surrounding the city centre (notably Everton, Granby and Vauxhall), and; b) some peripheral social housing estates (such as Netherley, Croxteth, Speke). Compensating for this loss of social housing the city saw a considerable volume of new housing construction: a) replacement housing of the sites of this cleared social housing (usually fewer dwellings, at lower (suburban) densities and often for owner occupation rather than social renting; b) new suburban house building for owner occupation, mainly on small infill sites, and; c) the emerging phenomenon of city centre and dockland apartments (for owner occupation and private renting) from the early 1990s onwards.

pool has brought suburban forms of living into the central city. The question of who has which interests and what power in the process of demolition will be explored in the second part of the project (governance analysis).

The role of students in the housing markets of shrinking cities fluctuates between being a social group that have special niche needs and a primary target group for real estate investment and private landlords. In Liverpool, new condominium towers with small flats were built recently in the inner city, especially to meet specific demands and needs of students. In *Leipzig*, given the oversupply of housing, especially in pre-1918 housing stock, student flat sharing has become a convenient form of tenant's arrangement for landlords. Students routinely organize the recruiting of new flat shares, replacing those who leave; they also take over the risk of having vacant rooms and pay for it. Therefore, students have become a stable type of residents, causing fewer problems and securing high occupancy rates.

In some cases, selective out-migration may lead to an increasing age-specific segregation in residential districts when the younger age groups leave, while the older age groups are left behind. This reinforced and place specific ageing leads to a spatial concentration of the elderly in some cities like it has been the case in some districts of Leipzig, Halle or Genoa where it coincides with high shares of under-used flats in some inner-city districts. A concentration of the older age groups, however, does not take place in those districts with the highest vacancy rates. Age-specific segregation is, subsequently, at most an indirect consequence of urban shrinkage, since it is caused by selective out-migration, a process that is typical and often to be found in shrinking cities but not exclusively there. Nevertheless, the context of shrinkage impacts on the dynamics of age-specific spatial differentiation of residents: when it comes to age-specific segregation, shrinkage – in the case of oversupply – leads to less rejuvenation in ageing neighbourhoods that become less attractive for young households looking for a flat. These neighbourhoods experience a more rapid aging process (or simply less rejuvenation) as they normally would in growing cities with high housing shortage. Also, there is no such pressure/need for the starter/first-time households to share flats with parents or grandparents. Since the first-time households usually leave the flat of the parents or grandparents, the left-behind neighbourhoods are again ageing (e.g. in Genoa, Leipzig, Halle). Urban shrinkage leads in most cases to a de-densification in the affected areas. This might not have so much impact on the social structure in terms of shifting between low and high-income households from place to place. Yet it is likely to impact on the age structure of neighbourhoods or a specific concentration, given it is the result of selective out-migration. This is, for example, the case in the inner city of Genoa where de-densification and out-migration have led to ageing, a concentration of elderly single households and increasing vacancy rates in old building stock, or in Ostrava where a highly appreciated housing estate (Poruba) has faced rapid ageing because the young people are those who leave, whereas family households turn into empty-nester households and are left behind.

Technical infrastructure

From the gathered information, it has been difficult to provide a clear and comprehensive picture of the impact of shrinkage on technical infrastructure, mainly due to the lack of comparable data for water and waste water supply and central heating. The German case studies including some examples of extreme shrinkage at the district level (e.g. Halle-Silberhöhe; Leipzig-Grünau) suggest that there are important consequences of population losses on the functionality and economy of technical infrastructure; yet is an open question whether this is similar in other cities.

As a general assumption we expect the water and waste water infrastructure developments to exhibit similar patterns to the housing market: since many cities of our sample, mainly the former state socialist ones, had suffered previously from acute housing shortage and have seen a release of the existing pressures since 1990, the same is highly probable the case with respect to water, heating, and electricity demand. Except for the eastern German case studies, no other research team has mentioned a (large-scale) demolition of surplus technical infrastructure or the necessity of such a demolition for their respective city, though some downsizing have occurred in some areas (e.g. Makiivka). At the same time, the impact of shrinkage on these sectors is often not very much visible, because the situation is complicated by all sorts of technical (e.g. leaking pipes, cut-offs) and economic (e.g. utilities payment arrears) issues.

The only problem that seems to be increasingly common for all cities has been the motorized traffic. However, this has surely been not a consequence of shrinkage, but is the result of increased private car ownership (especially in east European countries, which had suffered from acute motor car shortages under state socialism). As the consequence of increasing individual motorized traffic, some bus, tram, and trolley-bus lines were closed in some of the cities. Moreover, the reduction of public transport subsidies and the introduction of new higher fares have led to a falling demand for public transport.

The issue of technical infrastructure has to be discussed in close relation with the scarce municipal budgets too. In contrast with Leipzig and Halle, where the technical infrastructure has been completely renovated with help of the fiscal transfers from western Germany, the east European case studies have continued to suffer from a very poor technical state of the public infrastructure and a public investment backlog. In recent years, renovation activities have taken place mainly with respect to the overall economy-relevant fields such as traffic and communication infrastructure; whereas other types of infrastructure related to housing, public transport, water or electricity have been left behind. Often, the investment backlog is related to the poor technical state of the building stock too, e.g. in Bytom or parts of Donetsk and Makiivka. The latter represents a typical situation of old industrial former state socialist cities where the oversized technical infrastructure has not yet become a particular problem in the Donetsk-Makiivka conurbation as such, due to the severe under-investment into social and technical infrastructure under state socialism. The most pressing issues for the local authorities and the public utilities companies they own, including central heating, gas, electricity, and water supply, have been the very poor state of the inherited technical infrastructure (especially, central heating and water and wastewater mains), high maintenance costs, high payment arrears (especially in poor Makiivka neighbourhoods), and the continued disinvestment into the public infrastructure by central government. Weak(ened) municipal budgets of Donetsk and, especially, Makiivka can hardly cope with the scope and extent of the technical infrastructure problems. This would also apply for the case of falling demand and oversize. In neighbourhoods that have been especially hit by the above mentioned problems, dilapidation of housing stock and technical infrastructure have led and lead to (further) out-migration (and the emergence of a vicious circle of shrinkage).

To generalize, one cannot argue that oversized technical infrastructure represent a problem of shrinking cities. Firstly, in most cases not the whole city is affected by shrinkage, but particular districts. Secondly, the acuteness of the problem depends on the density of land use in the affected districts: more densely settled/used districts are more tolerant towards shrinkage, that is, population decline and a decreasing density of use(s) represents, as a start, some sort of relief. And, thirdly, the fact whether oversized infrastructure represents a problem relates to the scope and extent of the shrinkage per se. In Halle and Leipzig, for example, some of the prefab housing estates like Halle-Neustadt or Leipzig-Grünau have experienced population shrinkage of 50 per cent, followed by the demolition of parts of their housing stock. Subsequently, the systems of technical infrastructure have had to be adapted. But the cases of Halle

and Leipzig represent rather an exception – none of the other case study cities has experienced a similar process of demolition and adaptation of infrastructures (massive closure, large-scale restructuring). Up to present, the number of districts being extremely affected by population decline and abandonment – e.g. Halle-Silberhöhe, Leipzig-Grünau, Ostrava-Hrušov – in our case study cities is still too small to make a definite conclusion at a broader level. At the moment, the question whether there is a “tipping point” from which onwards the oversized technical infrastructure becomes a problem cannot be answered, but this issue should remain an important point for the further discussion. The same is true for the relation between disinvestment in technical infrastructure and shrinkage/abandonment at the total city and district level. The case of Bytom indicates that the infrastructure in poor condition contribute – in combination with the housing stock being in poor maintenance – to outmigration. The relation between tight municipal budgets and the maintenance of technical infrastructures is a more complex one, as the cities are able to mobilize other funds, e.g. from the EU or via commercial bond markets to improve the state of their technical infrastructure.

Land use and environment

The decline in industry and consequent emergence of brownfields is a result of economic change and not generally, exclusively or inevitably a result of shrinkage (population decline). Some brownfields are an indirect consequence of shrinkage when population loss leads to further (non-basic) economic decline and brownfields (e.g. closure of a school, public transport infrastructure or enterprise).

As shrinkage often goes hand in hand with a crisis *in*, or even a collapse of the established industries, it has also been reflected in the expansion of brownfields, i.e. the areas and sites that were traditionally used for industrial production, but later on became vacant as a consequence of industrial decline or restructuring. This problem is clearly visible in all of the cities, however, it has been most intensive in those cities that were a) historically characterized by highly space-intensive industries like coal mining (Ostrava, Bytom, Sosnowiec, Donetsk, and Makiivka), or ports (Genoa and Liverpool), and b) experienced an abrupt end or down-scaling of this historical heritage due to the closure of the respective industries and functions. In those cities where the economic restructuring had already taken place in the 1970s and 1980s and where the urban policy was aimed at the re-use of brownfields, this problem could and has been (comparably) successfully managed (e.g. in Genoa or Liverpool).

In those cases, however, where deindustrialization has started suddenly and went along in a very short time, e.g. in most of the former state socialist cities, un-used brownfields developed into a vast phenomenon. In Leipzig, for example, the number of un-used brownfields reached 3,000 by the early 2000s, covering a surface of 900 hectares. One can suppose that in other east European industrial cities there has been a similar situation. Due to the acute lack of data but also due to a certain ignorance of the problem, many of these brownfields have remained un-used over years. This is especially problematic with respect to the so-called blackfields, which are strongly polluted areas of former chemical, mining, and metallurgical industries. These areas in many case have remained 'un-treated' and were abandoned to the wild natural processes, which has in some cases been positively/euphemistically described as 're-forestation' or 'greening-up' (e.g. in Bytom, Sosnowiec, Donetsk, and Makiivka). In some of the cities, brownfields are not perceived to be problematic areas due to their former industrial use and underlying pollution. Though in Donetsk, most of the recent brownfields (but not the 'blackfields') have been re-used or allocated for re-usage, in other mining cities like Sosnowiec, Bytom or Makiivka, these areas represent just unused land. Nevertheless, it is obvious that the emergence and expansion of unused lots is an important feature that is closely related to industrial decline. As industrial decline has proved to be one of the key drivers for

shrinkage (see part 2.1 of the paper) it is not very surprising to see that the under-usage of urban space has become a common characteristic of all the cities under investigation too.

As it has been mentioned already above with regard to the other “arenas of impact”, the emergence and existence of brownfields affects only some parts/districts of the cities. We can, for instance, observe a concentration of brownfields in the (former) industrial working-class areas. Often, they have contributed to the visual appearance of decay and decline and the poor image of these districts in the public perception. In some cases, new uses appear to be very unlikely for (most of) these brownfields, so re-development and greening strategies are badly needed (e.g. in Leipzig and Halle). Yet they are met with financial barriers: no locally-available funds exist for the expensive re-design and management of brownfields and the decontamination of ‘blackfields’. In other cases there is a demand for derelict land because it is situated in the city centre (in port cities like Genoa or Liverpool) or in favourable locations within the city (in mining cities like Donetsk, Ostrava, Sosnowiec and Timișoara). In those cases, areas of an “internal suburbanisation” have developed, be it of either residential or commercial character. The share of reused, formerly abandoned land in residential areas is, at most places, higher. In Liverpool e.g., within residential areas, most cleared sites (brownfields) have been re-used, especially with rising housing demand in the 1990s and 2000s (up to 2007). There was a transition period (circa 1980s when these sites did create fractures in the urban landscape and have an adverse effect on the walking/living environment, but that time has passed. In some instances shrinkage has allowed the local authority to remove some land from residential use in order to create parkland (e.g. Everton Park). In other cases, e.g. in Genoa, the problem is that not always brownfields are converted into public space because of ownership structure or a shortcoming of investment funds.

As far as the decontamination and revitalization of brownfields and blackfields is concerned, the situation in our case study cities differs. In the two eastern German cases, Leipzig and Halle, funding for brownfield remediation/reuse comes from a federal institution while the decision is made by local authorities. In the Czech Republic, the situation is similar: Here, the city council that makes the final decision is supported by a national agency that arranges the contacts between owners of brownfields and investment interests. In England most funding for brownfield remediation comes from central government, so this is not an issue for the Liverpool city council. For most of the former state socialist industrial cities, the demand of funds exceeds any coping capacities: The revitalisation of brownfields and the decontamination and re-use of ‘blackfields’ in these cities have so far presented an insurmountable problem for the limited financial resources available to the two city councils. As most of the (still existing) industries and enterprises have had to deal with a massive cost of enterprise restructuring and technological up-grading, even the largest private firms in the regions have been unable to carry the burden on their own, with virtually no public funding available to re-develop the industrial landscape.

Even when environment in some of our cases did not play an important role for the development of shrinkage (e.g. in Liverpool or Timișoara), improvements of the environmental quality at these places might have an impact on slowing down or stopping shrinkage. The location of new, tertiary industries does seem to be influenced by environment. According to the discourse on globalisation and ‘competitive cities’ the environment is one dimension that influences the ‘marketability’ of a city and its ability to attract economic growth, and therefore employment, and therefore population.

Ironically, the loss of economic power and deindustrialisation affecting most of the cities concerned has led to a marked improvement in the urban environmental quality. Pollution caused by industrial producers has considerably reduced, or, in some cases (Leipzig), have nearly completely disappeared. This applies firstly to air pollution with sulphur dioxide, carbon monoxide, nitrogen oxides and heavy metals. Moreover, the industrial pollution of surface

water as well as of ground water was remarkably reduced. In almost no case, however, the improvement of the environmental situation has been the result of an active environmental policy; it has rather been a 'side effect of industrial decline. In cities with the remaining heavy industries like Bytom, Sosnowiec, Donetsk, Makiivka, and Ostrava, air and water pollution continues to be a serious environmental and public health concern. Again, the working-class districts close to the heavy industries are the most affected. With the considerable increase in motorized traffic, a new source of pollution, this time by polluters like benzyl and nitrogen oxides as well as noise, has emerged in the transition countries since the fall of state socialism. The impact of environmental degradation on out-migration decisions remains, however, significant how the example of Donetsk and Makiivka shows: There, the very poor, albeit much improved, environmental conditions in the Donetsk-Makiivka conurbation have had an adverse impact on the demographic developments in the two cities both through poor public health consequences and as a strong incentive for the young, upwardly mobile individuals chasing the 'quality of life' to out-migrate from the conurbation. It has been suggested that a marked improvement in the quality of the urban environment, especially a reduction in air, water, and dust pollution, combined with an increase in green space and the increased investment into the household waste management and recycling, could provide both Donetsk and Makiivka with an opportunity to retain highly-skilled professionals.

Municipal budgets and finances

To assess the impact of urban shrinkage on the financial situation of the cities regarding their municipal budgets has proved to be by far one of the most difficult issues across the analyzed topics/fields of impact. This is mainly due to the following reasons:

- there is still a lack of knowledge about the detailed revenue and expenditure structure and dependencies of municipal budgets in the case study cities, which needs to be addressed in further research;
- there are huge differences in the internal structure of municipal budgets between the case study cities and countries, making it very difficult to compare individual urban funding arrangements directly;
- there are differences in the use of and dependency on external funds such as the EU structural subsidies among the case study cities, a fact which has been further complicated by the national systems of fiscal transfers and territorial income re-distribution.

At a general level, it can, however, be stated that almost all of our case study cities suffer from declining tax revenues, due to the loss of inhabitants, and, subsequently, as a direct consequence of population decline. Ostrava seems to make an exception here, since in this case the declining population numbers did not influence the positive development of the municipal budget. Some of the cities have been disadvantaged too, due to the lack of attractiveness for investment (e.g. Halle, Bytom, Makiivka); they are mainly the cities that form the 'weaker' part of a conurbation or a wider urban region, neighbouring a larger or more successful city. Suburbanization, no matter if residential or commercial, has led to the weakening of the municipal income as well, a phenomenon which has been very familiar to west European and north American cities for decades. At the same time, new suburbanites have continued using the infrastructure and amenities of the shrinking cities, mostly since they have maintained to travel to the cities to work, shop, and play. The same is true for the suburban businesses heavily using transport links financed primarily via the municipal budget, etc.

In some of the case study cities, the municipal budgets have also been burdened with rising expenditures at the same time as tax revenues decrease (Sosnowiec, Bytom, Leipzig, Halle).

Donetsk and other Donbas cities, forming one of Ukraine's economically strongest regions, have suffered from the national fiscal transfer system, which makes them contribute much more into the national budget than they eventually receive from the central government for local investment.

Public/external funding plays a role in some of our case study cities, so Liverpool is dependent from external funding to a great extent. About 60% of Liverpool's municipal budget in 2008/9 came from central government grants. To this must be added the direct expenditure of central government departments and agencies that occurred in the city (e.g. Housing & Communities Agency, the Regional Development Agency, the National Health Service), and the expenditure of the privatised utilities (e.g. United Utilities, EDF (electricity), Network Rail, privatised bus and rail companies, etc.). In Germany main revenues come from three sources, municipal taxes, share of income and sales tax, and municipal financial equalisation. A major part of municipal revenues stems from equalisation schemes that work in the context of the federal state. Especially for economically weak or shrinking municipalities, like Halle and Leipzig, these allocations make up for a lion's share of their budget. Because they are calculated on the basis of population figures, losses severely impact on the revenues of shrinking cities.

However, strained municipal budgets are not an exclusive problem of shrinking cities. And at some places there are fiscal and other financial transfer mechanisms that balance the situation for cities with problems which might be related to shrinkage. For instance in Liverpool, English local authorities are very large by European standards (average size 125,000 population), and many include shrinking and non-shrinking areas. There are two main local taxes – council tax (on households) and business rates (on businesses). But the revenue from business rates is pooled nationally and then redistributed. Local authorities with a low council tax base are compensated through central government's 'Revenue Support Grant'. In any case more than 60% of the municipal budget comes from central government and many services are not provided by local authorities.

Moreover, strained municipal budgets are not a prior problem for all our shrinking cities (e.g. not for Ostrava and Timișoara). On the contrary, shrinking cities might even be in the position of net donors within national fiscal transfer systems, a good example for this is Donetsk: Just over a quarter of the City Council of Donetsk annual budget expenditure in 2009 was funded through the central government transfers, making the city and its neighbouring urban areas effectively to 'fend for themselves'. Yet, considering the Donetsk-Makiivka conurbation is already a net donor of the national budget, both of the city council authorities find it extremely difficult to raise an ever increasing amount of revenues through local taxes, rents, profits, and fees, without undermining the fragile business environment and the two urban economies even further. A strained municipal budget has appeared to be the most frequently cited issue in the local urban studies literature as well (see Amitan, 2002; 2004; Amitan *et al*, 2001; Lyakh and Tkachenko, 1998). Donetsk's municipal budget has also been affected more directly by shrinkage after the city had lost its 'one million inhabitants' officially designated status, which used to entitle the city to extra central government funding. The same is true for Timișoara and its surrounding region (Timiș County). Genoa is a high income city but of course with a smaller population. It is the low rate of new building which gives less money to the municipal budget, but municipal debt problems cannot be explained with shrinkage. Money collected at a local level is only a small part of the whole municipal budget.

4. Challenges of urban shrinkage: Conclusions and programme for further research (including WP5 governance analysis) ...

The following listing represents a collection of ideas and questions that remains from our hitherto work for the future. The listing represents a first collection and does not claim to be exhaustive – it will be completed in a later version of this paper.

Shrinkage

- How does the *persistence and severity of shrinkage* impact upon a locality's ability to deal with the consequences? Are processes of massive, rapid shrinkage and a continuous process over a long time qualitatively seen different phenomena? While the first mentioned is often perceived as a catastrophe or disaster, the second mentioned could be sometimes not be regarded at as a problem at all since it happens more smoothly and remains hidden in its complexity.
- Is there a *trigger or causal relationship* leading to population decline that matters in the majority or even all of our case studies? Is it perhaps a combination of economic decline and job-related out-migration plus the long-term consequences of death surplus and ageing? How do different factors interact exactly in a complex causal relationship? Can such a general approach also be applied to single parts of a city, and how does the impact of a complex causal relationship change over time?
- Can scientists provide *longer-term prognoses* about the development of urban shrinkage for a particular city or even for specific local settings and types of shrinking cities? Which knowledge is necessary to come up with long-term assumptions?

Governance

- How do the *cooperation and networking* of different actors work under the conditions of urban shrinkage? Is there a general or qualitative difference in comparison with non-shrinking cities? Are actors' constellations in shrinking cities characterized by weak players, few resources and a lack of capacities with respect to the existing challenges?
- How does *participation* work in shrinking cities? Is the civil society weak in shrinking cities? How it looks like, and is there common characteristics which are typical for the majority of cities under investigation?
- How do *governance arrangements* fit with the problems/challenges that should be solve d by them? If we do not aim to develop a „one-size-fits-all“ model, should we seek to develop a „flexible-size-fits-at many-places“ model, or should we treat each case as specific and come up only with very general recommendations at the end?

... and urban practice (WP4 stakeholder workshops)

The following listing represents a collection of ideas and questions that has come up from our hitherto work for the WP4 stakeholder workshops as well as the governance analysis. The listing represents a first collection and does not claim to be exhaustive – it will be completed in a later version of this paper including the results of the WP4 stakeholder workshops.

- Considering the diversity in the causes and consequences of shrinkage which this report identifies, can any 'one-size-fits-all' recommendations be made to localities for dealing with such consequences?

- How does the persistence and severity of shrinkage impact upon a locality's ability to deal with the consequences? According to our hitherto knowledge, the persistence of shrinkage impacts on the way stakeholders are thinking about the future development of their city. In this respect, the situation in our case study cities is quite different. Moreover, we think that massive, rapid shrinkage mostly leads to specific and drastic measures while long-term, moderate shrinkage need not to lead to any specific actions. In this vein, it would be also interesting to discuss with stakeholders what are the criteria or thresholds to counteract shrinkage for them (in terms of severity and persistence).
- Do municipalities have to accept the fact that they are shrinking (not taboo it) and to deal with it in an objective (not in an emotionally uploaded) manner? Do they have to support capacity building and knowledge creation (in terms of monitoring, expert knowledge, networking, usage and funding of scientific analyses) and to build up appropriate networks of actors to deal and cope with shrinkage? Do they have to assure a minimum degree of participation and involvement of the broader public?
- Are shrinking cities that acknowledge the fact that they are shrinking more successful than those that are ignoring it? Or, to put it differently: Is it (generally) more advisable to perceive shrinkage as a problem to be solved and to go for growth policies and recovery, or to accept shrinkage and to develop new visions and strategies for the changed circumstances?
- Is it inevitable for a successful coping with shrinkage that a city has a clear vision of the future and a general strategy where to develop in the future? With respect to our case study cities, there are differences: While some of our cities do have a clear vision of where to develop, some have not (Donetsk, Makiivka, Bytom, Halle). Those who have a vision set the focus either on service sector development (Leipzig, Liverpool, Genoa) or IT sector development, create industries and reindustrialization (Ostrava, Timișoara, Sosnowiec).
- Do we find comprehensive or selective / sector- and /or area-specific instruments and measures counteracting shrinkage in our cities? Do shrinking cities inevitably need a comprehensive planning model/vision or are incremental measures/actions also acceptable?
- Would advice to national governments for dealing with the consequences of shrinkage differ from advice to local governments? Cross-referencing our hitherto expertise, we would say yes. There are many examples but always depending on the responsibilities of the national and local level in a particular country. Generally, the national level shapes the legal and institutional framework for local decision-making. It can enable local governments/planning bodies to have more power, e.g. with respect to negotiations with private actors, or to be largely independent in spending the part of their budget which is disposable. The arenas which we analyzed within the first phase of our project are cases in point to show how the national level could better support shrinking cities to cope with their problems.
 - *fiscal transfer policies*: advise to national governments to change national fiscal policy; Donetsk-Makiivka is a negative example in this respect since the hitherto national policy leads to the exploitation of the region and does not support to stabilize the economic and social situation
 - *tax policies*: e.g. Germany: to stop tax subsidies for suburban housing an issue that cannot be done by municipalities so far; to stop tax subsidies for new build suburban housing, instead subsidize of renovation of the existing stock
 - to enhance municipalities to redevelop deprived areas and abandoned land by creation of respective institutions (e.g. UK redevelopment agencies, German Sanierungsgebiete)

- *housing*: to support and finance programmes for social housing (moderate-priced housing in decentralized locations, mixed tenure)

- *brownfields*: see above and support the creation of special economic zones (like e.g. in Poland), either for particular municipalities or whole regions such like eastern Germany

- *policies of the national level* should counteract those developments that aggravate the regional inequality and mostly disadvantage shrinking cities (phenomena like “extended workbenches”, brain drain, net-losses in national fiscal transfer systems)

- Is it a general conclusion that the national level has to get more involved and has to provide more funds for shrinking cities? What can be done at the national level to empower more the capability of shrinking municipalities to make decisions according to their priorities? Would it be helpful to encourage/oblige shrinking municipalities to create long-term strategies concerning population, economic, infrastructure etc. development (as it is the case e.g. in Germany, Poland) and to exactly preview/document which activities should be financed with additional funds?
- The national level should be responsible to assure the actionability and solvency/liquidity of municipalities which are crucial prerequisites to counteract challenges like shrinkage. Municipalities need to be able to follow their local priorities and to dispose at a minimum share of their budget which is disposable and not earmarked.

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