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Segregation, gentrification, and residualisation: from public housing to market-driven housing allocation in inner city Stockholm

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From the 1930s and into the 1990s, public housing in Sweden was a key element in the Social Democrats' ambition to construct a housing system that would secure high-quality, affordable housing for all. The Liberal–Conservative national government of the early 1990s initiated important changes to housing policy in Sweden and allowed for local decision-making concerning tenure conversion, the conversion of public rental housing into market-based (cooperative) housing. Stockholm city decided early on to invite public housing residents to buy their dwellings, under the condition that at least half of the residents living in a particular property were in favour of buying. In this paper we ask two questions: in what way did the subsequent and substantial tenure conversions change the population mix of affected neighbourhoods? Second, have tenure conversions in inner city Stockholm contributed to increasing levels of segregation in the city of Stockholm? We hypothesise that inner city Stockholm has further gentrified and that non-converted public housing properties, predominantly found in the suburban parts of the city, experience residualisation (households have become poorer in relative terms). In short, we expect and also document increasing levels of socio-economic segregation as the result of this right-to-buy policy.

Keywords: public housing; tenure conversions; Stockholm; Sweden; gentrification; segregation

Introduction

Over the last 20 years, the proportion of public rental housing has been radically reduced in Sweden's capital city, Stockholm. In 1990, 32% of all residents lived in this tenure form while the proportion in 2010 stood at 18%. The change has been even more profound in the inner city where conversions have brought the proportion of public rental housing down from 19% to 7%. This change is not due to

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demolitions but due to ideology-driven efforts to convert public housing into market based cooperative housing. In addition, private rental housing in the inner city has been heavily reduced so the total rental stock has decreased from 73% to 36%. Meanwhile, the proportion of market-based cooperative housing in the inner city has gone up from 26% to 62%.

The future role of Swedish public housing, namely housing owned by municipal housing companies, has been avidly discussed over the past two decades. Most of the privileges traditionally held by public housing companies (Elander, 1991; Kemeny, 1995) have been dismantled and these companies must nowadays compete on the same market terms as private rental companies (Bengtsson, 2012). Seen from the perspective of the municipal housing companies themselves, this challenge has often been successfully met and most of the approximately 300 companies – especially those operating in larger cities – are economically secure. Other challenges, which will be elaborated on below, have, however, influenced the companies' ability to play a key social role in Swedish housing policy and to remain a cornerstone in the welfare state system. One such important social role is to contribute to the counteraction of segregation.

Municipal housing companies have traditionally not only been important actors in initiating new housing construction for accommodating increasing urban populations, but they have also been key actors in the housing mix policy established as a national goal already in the mid-1970s (Bergsten, 2010; Bergsten & Holmqvist, 2013; Holmqvist, 2009). Newly built neighbourhoods often comprising a mix of tenure forms, typically municipal rental housing and cooperative housing, contribute to establishing a mix of social and demographic categories. By converting existing public rental housing into cooperatives it is very likely that the level of social mix will be reduced. Our contribution in this paper is to empirically assess whether this is in fact what has happened.

Sweden has witnessed a rapid transition from a regulated and subsidised, social democratic housing system to a deregulated, market-based system. Similar tendencies – albeit with different contextual circumstances – are found in other countries, such as the UK and the Netherlands (see, for example, Gruis, Elsinga, Wolters, & Priemus, 2005; Jones & Murie, 2006; van Kempen & Priemus, 2002; Whitehead & Scanlon, 2007). In Sweden, the right-to-buy policy (i.e. offering public housing residents the chance to collectively buy a property and establish a cooperative) has been contested by the political left. Despite the fact that the liberal reforms clearly have been launched on ideological grounds, it has nevertheless proven difficult to roll back such reforms even during periods when there are social democratic majorities in central and local governments. Stockholm city and other municipalities in the Stockholm region have played leading roles in this transition.

Over the last 10–15 years, several scholars have noted the dramatic shift in housing policy in Sweden. In 2002, Turner and Whitehead declared that 'Housing policy has been undergoing rapid change across Europe and the industrialized

world. This change has been particularly dramatic in Sweden where housing has traditionally been a core element of the welfare state' (p. 201). In a recently published paper by Hedin, Clark, Lundholm, and Malmberg (2012), gentrification and filtering processes are analysed for Stockholm, Gothenburg, and Malmö up until 2001. The authors map developments across these regions over a 15-year period (1986–2001), linking the socio-spatial developments to the neoliberalisation of Swedish housing policy. They argue, as have also Lind and Lundström (2007), that Sweden currently has one of the most liberal housing regimes in the world, with very little state intervention, and they hypothesise that further policy changes after 2001 have continued to increase social polarisation. Christophers (2013) argues that Sweden now represents 'a monstrous hybrid' with clear signs of neoliberalisation but with considerable regulatory framing still in place. He identifies increasing housing shortages, due to the undersupply of rental units, along with escalating purchase prices as the two biggest challenges that contemporary Swedish housing policy must overcome.

Although many of the politically induced changes in regulations, taxation, and the housing allowance system since the 1980s have affected all Swedish cities, Stockholm's conservative/liberal majority has without doubt played a key role in the transformation, not least in the way the city has actively promoted the conversion of public housing into market-based housing (cooperatives). In the Swedish context, cooperative housing means that an association comprising all members formally owns a property and that they collectively decide on maintenance levels, investments, and annual (monthly) fees that cover capital and variable costs of running the property. Members include all those who have purchased the right to live in one of the dwellings and members annually elect a board of directors (consisting of a handful of members). The price for winning a dwelling contract is normally decided in a bidding race involving a real estate broker, and the system thereby has similarities with a condominium system (Turner, 1997).

In this paper, we ask two research questions: in what way did tenure conversions in Stockholm change the population mix of affected properties and neighbourhoods? And, have tenure conversions in inner city Stockholm contributed to increasing levels of segregation in the city of Stockholm? We hypothesise that gentrification of inner city Stockholm has intensified and that non-converted public housing properties, predominantly found in the suburban parts of the city, experience residualisation (households have become poorer in relative terms). In short, and consistent with the findings of other studies, we expect increasing levels of socio-economic segregation as the result of this right-to-buy policy. The argument sometimes put forward in the British context, that right-to-buy policy would 'stabilise neighbourhoods', has proven questionable (Jones & Murie, 2006); neighbourhood stabilisation is even more unlikely in the context of tenure conversions in attractive and often already partly gentrified neighbourhoods in inner city Stockholm (see also Bergsten & Holmqvist, 2013).

The paper is organised in the following way. In the next section we introduce the key concepts used already in the title of this paper. All three of them – segregation, gentrification, and residualisation – have generated a vast body of literature and it is beyond the scope of this article to do justice to the many theoretically and empirically relevant studies available. The ambition here is merely to briefly introduce and define the concepts so that they can be applied in our empirical study. After that we offer a brief summary of the policy development with respect to conversions of public rental housing, followed by the first empirical account of the structural changes occurring in the Stockholm city housing market, describing the situation in 1990 and 2010. This section deals in a descriptive way with the residualisation issue and thus focuses on overall patterns of change in the Stockholm city housing market over this period. The paper goes on to narrow the analysis to a somewhat shorter period of time (1995–2008). We focus directly on converted and non-converted rental housing properties and make use of the longitudinal potential of the collected data-set. We thus analyse who moves in and moves out of the converted properties and try to assess the more direct gentrification effect of the conversion of public housing. Finally, in the conclusion we provide an outlook over the years ahead.

Conceptual frame and definitions

Segregation can be addressed both as a static distribution of social categories across space but also as a dynamic phenomenon whereby such socio-spatial distribution undergoes change over time. This latter way of conceptualising urban segregation was acknowledged very early on, not least by the Chicago sociologists in the early decades of the twentieth century (Park, Burgess, & McKenzie, 1925). They used concepts such as filtering and succession in order to show how particular neighbourhoods changed over time; some household types (categorised on social class and/or ethnic grounds) moved out of a given neighbourhood, while others moved in. Much later, the concepts of gentrification and residualisation were introduced to understand particular dynamics in the urban segregation process. Whether understood from the production side (see Smith, 1987, 1996) or consumption side (Jager, 1986; Ley, 1996) of the capitalist economy and social relations, gentrification is a process whereby a neighbourhood undergoes social upgrading so that the residents over time tend to have more resources in terms of education and income (Lees, Slater, & Wyly, 2010). Much empirical focus has been placed on inner city areas that at one point in time were working-class neighbourhoods and later, by way of selective migration and housing and commercial reinvestments, became more middle-class areas. The concept of residualisation sometimes describes more or less the opposite process, that an area over time comprises residents with less resources but it has also been applied to a more general discussion of housing systems and housing models (see Harloe, 1995; Malpass, 1990). Forrest and Murie (1988) prefer the

term marginalisation to explain why public housing (council housing) is becoming residual as a consequence of the British 'right-to-buy' policy. They find, not surprisingly, that it is the weakest segment of the former tenants that remain in the sector after tenure conversions have taken place. In the context of public/social housing and segregation, the term residualisation was – as far as we can ascertain – first applied to describe the effects of the British right-to-buy policy but as similar housing reforms and regulatory changes have spread to other countries, so has the concept (see, for instance, Magnusson & Turner, 2008; Meusen & van Kempen, 1995; Turner, 1994).

In our interpretation of the key concepts informing this study, we define segregation simply as the unequal representation of socio-economic, demographic, and ethnic categories across space. Increasing segregation refers to a tendency whereby particular population categories – such as low- and high-income people and different educational or ethnic categories – come to live on average more at a distance from each other. We apply the gentrification concept for a type of neighbourhood change meaning 'social upgrading', which we define as the increasing presence of high-income and/or highly educated categories at the expense of low-income or low-educated categories. We reserve the term residualisation of public housing for a situation whereby public housing sector residents over time tend to have fewer resources in terms of income and education. If that is what happens, a further geographical concentration of public housing will also result in increasing levels of social segregation by class.

Tenure conversions in Sweden and Stockholm – a brief political background

The Liberal–Conservative national government of the early 1990s initiated important changes in housing policy in Sweden (see Lindbom, 2001) and allowed for local decision-making concerning conversion of public rental housing into market forms (cooperative housing). The formal decision was taken in 1992 but it was based on ideas proposed by the UK Conservative government more than 10 years earlier (see Forrest & Murie, 1988). In some Swedish municipalities, predominantly those having a Social Democratic majority, this decision had no or small effects on the housing market. In others it had very profound effects, as conservative/liberal political majorities decided to completely sell off substantial parts and in some cases all municipal housing either to private rental companies or to cooperative associations. The Social Democratic governments ruling between 1994 and 2006 introduced measures intended to make it more difficult to sell off public housing. The new laws required that individual properties had a 75% majority of residents in favour of buying (instead of a simple majority) and municipalities were prohibited from selling the municipal housing company to private interests. These measures clearly had effects and the pace of tenure conversions from public housing to cooperatives slowed down. With the return of a Liberal–Conservative government in

Table 1. Number of public housing dwellings sold in Sweden from 2000 to 2010.

Year	Stockholm city	Rest of Stockholm county	Rest of Sweden	Entire country
2000	4500	13,500	6000	24,000
2001	7200	4800	4000	16,000
2002	2000	700	4300	7000
2003	100	100	2800	3000
2004	70	70	5460	5600
2006	0	20	2180	2200
2007	1000	2000	5000	8000
2008	11,600	900	5500	18,000
2009	8000	2200	4600	14,800
2010	7500	2500	5000	15,000
Total	41,990	27,090	51,840	120,920
Percentage	34.7	22.4	42.9	100.0

Source: Bostadsmarknaden 2011–2012. Karlskrona: Boverket (Swedish Board of Housing, Building and Planning) (http://www.boverket.se/Global/Webbokhandel/Dokument/2011/BME-2011-2012.pdf).

2006, however, these countermeasures were abolished and sell-offs and conversions have regained momentum (see Table 1).

Encouraging ownership, mainly by conversion from public housing to cooperative housing, is according to the government's rhetorical phrasing 'an essential means in the fight against social exclusion'. The leading politician responsible for housing issues in Stockholm recently also stated that 'sell-offs provide financial resources to be reinvested in new public housing developments' (Joakim Larsson Blog, 2012). It is correct that the city of Stockholm has continued to build new public housing, but the number of new developments is not anything near the amount of sell-offs. In 2010, 15,000 dwellings were sold out in Sweden, equal to the number the year before. According to the Swedish Board of Housing, Building and Planning (Boverket, 2011), the Stockholm region continues to lead this development and in contrast to municipalities elsewhere most of the dwellings in the capital region are sold to cooperative associations. Elsewhere in the country but also in less attractive parts (low-income areas) of the capital city itself, buyers are predominantly private rental companies. Public housing continues to be a politically contested tenure form and most Social Democratic municipalities – like Gothenburg and Malmö – continue to maintain and develop public rental housing. In Stockholm, however, the political majority has shifted in almost every election, causing radical shifts in housing policy.

With the new opportunities becoming available in the early 1990s, Stockholm city decided to invite public housing residents to form cooperatives and buy their dwellings, under the condition that at least half of the residents on a particular property were in favour of buying. Residents in the most attractive part of the stock were

not difficult to convince as they could foresee big capital gains by purchasing properties at prices far below real market value. The subsequent privatisation of collective property is interesting in itself but we focus in this article on issues related to the socio-spatial effects of the conversion, and more precisely effects related to residential segregation.

Housing developments in Stockholm city from 1990 to 2010

One of our research questions concerns the effects beyond central Stockholm and whether remaining parts of public housing have undergone a process towards residualisation. We will approach this issue by making use of a set of register data covering all Stockholm city residents in 1990 and 2010. We draw upon a recent work by Andersson and Kährik (in press), who have developed a geographical classification of the Stockholm region based on a typology taking year of construction, housing type, and location into account. The authors identify four neighbourhood types: the historical inner city, the inner suburbs (existing before the post-World War II construction of the metro system), and two outer city neighbourhood types – those predominantly dominated by multifamily housing (at least two-thirds of the residents in multifamily housing) and those being either mixed or heavily dominated by single-family housing (see Figure 1). We confine our analyses to Stockholm city but are of course fully aware of the fact that the Stockholm housing market cuts across many municipal jurisdictions. We nevertheless argue that this limitation is appropriate given that tenure conversions are politically decided by the Stockholm City Council, and it is of interest to study how the city as such has developed as a result of the tenure conversion policy. Our analyses are furthermore descriptive in character and we do not intend to claim that it is possible to relate the sell-off of inner city public housing to all neighbourhood and housing changes in the city in a truly causal manner. However, we still believe that solid conclusions can be drawn from these data.

Table 2 displays some key data for different geographical and tenure segments of the Stockholm housing market in 1990 and 2010. We discuss the main conclusions that could be drawn from the table under four headings: population change, income polarisation, uneven educational upgrading, and ethnic restructuring.

Population change

The city's overall population increases substantially over the two decades, from 674,000 to 845,000 (+25%). The growth is biggest in the core and in the inner suburbs and these segments' respective shares of the city's population increase from 33% to 35% and 44% to 46%, respectively. As most of the capital region's suburban single-family housing is found outside of Stockholm city, this segment is by far the smallest in the city itself. Looking more in detail at the tenure

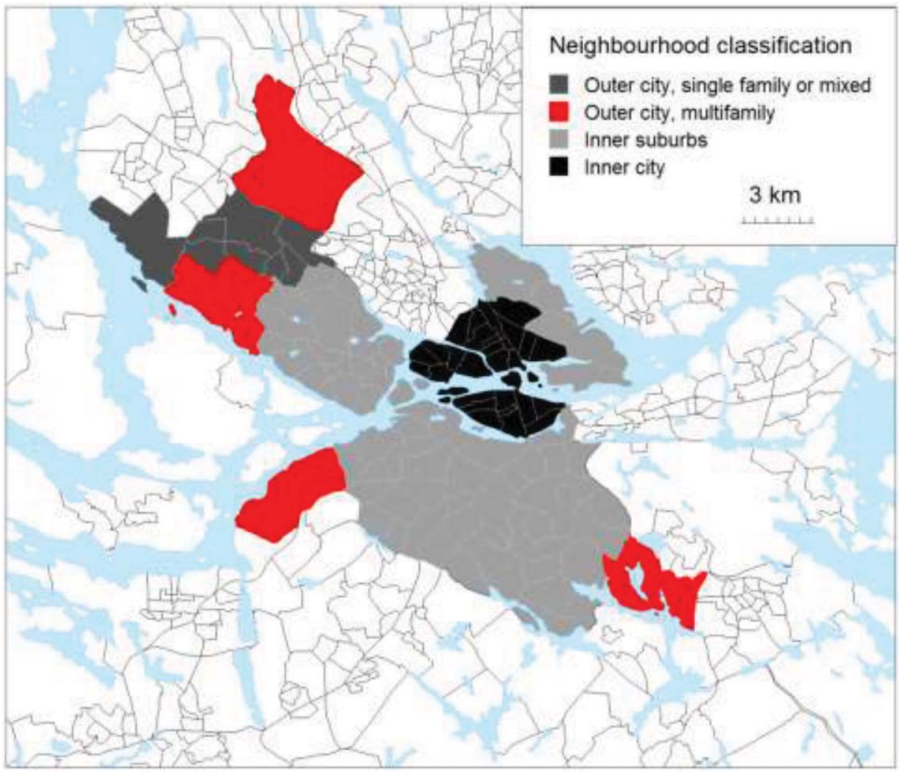

Figure 1. Stockholm city neighbourhood segments.
Source: The Geosweden database, Institute for Housing and Urban Research, Uppsala University.

transformation within the geographical segments, it is very clear that public housing decreases substantially in all segments but with varying dynamics. In the inner city, both public and private rental housing units are reduced while cooperative housing more than doubles its share; in 1990, 10% of all Stockholmers lived in cooperative inner city housing and they now constitute more than a fifth of the city's total population. A similar trend is visible for the inner suburbs, but here private rental housing more or less keeps its relative proportion of residents. The multifamily outer city segment also experiences tenure change and rapid reduction of public rental units, but in this case without much conversion into cooperative housing. Instead, it is public housing being sold to private rental companies that dominates the development. It should be noted that this is also due to political decisions.

Table 2. Population and socio-economic data for different geographical and tenure segments of the Stockholm housing market, 1990–2010. All data except for the population change data (data columns 1 and 2) refer to people aged 20–64.

Location	Tenure	Share of all residents in Stockholm city, 1990	Share of all residents in Stockholm city, 2010	Mean Income change, 1990–2010 (overall change from 1990 to 2010 is 100)	% in work income quintile 1+2, 1990	% in work income quintile 1+2, 2010	% in disposable income quintile 1, 1990	% in disposable income quintile 1, 2010	% low educational level*, 1990	% low educational level*, 2010	% non-western immigrants, 1990	% non-western immigrants, 2010
Inner city	Home ownership	0	0	132	55	42	14	17	14	0	0	0
	Cooperative	10	21	111	35	31	18	15	11	6	2	6
	Public rental	6	2	88	46	48	21	23	21	13	4	9
	Private rental	19	10	97	43	43	22	21	17	10	3	7
	Total	35	33	114	41	36	21	17	16	8	3	6
Inner suburb	Home ownership	9	8	118	30	24	14	12	14	6	1	4
	Cooperative	7	19	99	33	32	14	15	16	9	2	9
	Public rental	15	9	81	49	54	21	26	33	21	8	26
	Private rental	12	10	85	42	47	20	24	23	14	3	13
	Total	44	46	100	41	38	18	19	24	12	4	12
Multifamily outer city	Home ownership	2	1	84	29	36	13	19	17	14	2	26
	Cooperative	2	3	78	38	46	17	25	20	19	14	35
	Public rental	9	6	64	54	67	24	36	40	34	23	56
	Private rental	2	5	57	42	64	17	37	32	32	9	47
	Total	15	15	70	48	59	21	32	34	28	17	47

(*continued*)

Table 2. (*Continued*)

Location	Tenure	Share of all residents in Stockholm city, 1990	Share of all residents in Stockholm city, 2010	Mean Income change, 1990–2010 (overall change from 1990 to 2010 is 100)	% in work income quintile 1+2, 1990	% in work income quintile 1+2, 2010	% in disposable income quintile 1, 1990	% in disposable income quintile 1, 2010	% low educational level*, 1990	% low educational level*, 2010	% non-western immigrants, 1990	% non-western immigrants, 2010
Single-family/mixed outer city	Home ownership	5	4	98	29	28	13	14	15	9	2	12
	Cooperative	0	1	93	34	34	13	14	18	15	3	18
	Public rental	1	0	77	50	55	18	26	28	26	16	33
	Private rental	0	1	61	36	60	15	31	29	28	3	34
	Total	7	5	93	31	33	14	16	17	13	3	16
Total	Home ownership	16	13	109	30	27	14	13	15	8	1	8
	Cooperative	19	44	103	34	33	16	16	14	9	3	10
	Public rental	31	18	75	50	58	22	29	33	25	12	34
	Private rental	33	25	83	42	49	21	26	20	16	3	18
	Total	100	100	100	40	40	20	20	22	13	6	16

*Low educational level is less than 10 years of school education.
Source: The Geosweden database, Institute for Housing and Urban Research, Uppsala University.

Income polarisation

Five of the columns contain data related to work and disposable income. In the mean income change column, each value indicates deviation from the average income change from 1990 to 2010 in the city as a whole. Values above 100 mean that residents in a specific tenure form in a certain geographical segment have experienced a more positive development than the average, while values below 100 mean the opposite. If we first look at the subtotals for the four geographical segments, it is clear that we see a substantial relative income gain in the inner city, income stability in the inner suburbs, a slight relative decline in the single-family housing segment, and a huge relative income loss in the multifamily outer city segment. This indicates a substantially high level of socio-spatial polarisation. Not only did inner city residents have a much higher income already in 1990 compared to the outer city multifamily housing residents, but the income gap also widens dramatically over the period.

Looking at the tenure dimension of the change, it is clear that residents in two types of housing tenure gain over the period, namely home owners and cooperative members, while the residents in the two rental forms lose (see the total sum-up in the bottom section). However, this pattern is not the same in all four geographical segments. One obvious exception is the fact that residents in the outer city single-family-dominated neighbourhoods lose irrespective of their tenure form within these neighbourhoods. The relative loss is certainly biggest for private and public rental housing residents but it is substantial for all four tenure types.

We will now turn our attention to the subsequent two columns, displaying the proportion of people having low work income (those in the two bottom quintiles, i.e. the 40% of all aged 20–64 who earned the lowest income in 1990 and 2010). While the city average by way of definition is 40%, public housing residents have a higher concentration of low-income people and the concentration increases between 1990 and 2010 in all four geographical segments. This trend is most pronounced in the outer city multifamily housing segment; in 2010, two-thirds of the public housing residents had low work income.

Work income is of course a good indirect measure for an individual's position in the labour market, but as Sweden still has a fairly generous welfare system it is also of interest to see how peoples' disposable incomes develop over time. We report these data in two columns and show the relative concentration of the poorest 20% (quintile 1). Values over 20% indicate overrepresentation of poor residents. Among the most noteworthy changes is the reduction of poor people in the cooperative part of the inner city, while cooperative residents in the multifamily outer city segment comprise a much bigger proportion of poor people in 2010, compared to 20 years earlier. This once again confirms the trend that the Stockholm housing market is becoming increasingly segmented not only by tenure but also across space. Figure 2 displays a number of different segregation measures (segregation,

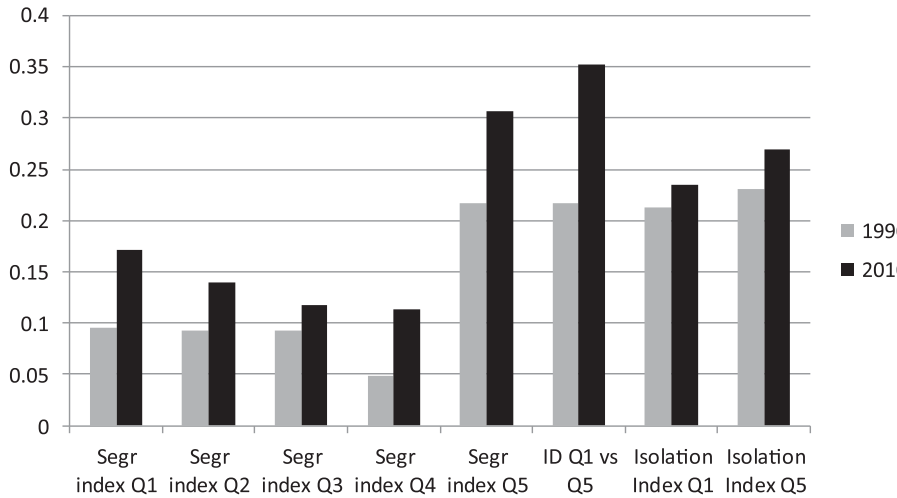

Figure 2. Disposable income segregation indices 1990 and 2010.
Note: A brief note on method – first, all aged 20–64 have been grouped into quintiles (20% strata) according to their disposable income in 1990 and 2010. Then the neighbourhood distribution of each quintile group is compared with all others' distribution (segregation index Q1, Q2, etc.). The index of dissimilarity is derived by comparing the neighbourhood distribution of the bottom and top quintiles. The isolation index measures the average probability of finding a member of one's own income stratum in a given neighbourhood.
Source: The Geosweden database, Institute for Housing and Urban Research, Uppsala University.

dissimilarity, and isolation indices) and further confirms this development. All disposable income quintile groups (quintile 1 is the 20% poorest and quintile 5 the 20% richest) become more segregated over time but it is the richest who are most segregated. The spatial differences between low- and high-disposable-income groups have rapidly increased (index of dissimilarity [ID] measure) and both groups become more isolated from other income groups.

Uneven educational upgrading

Like most cities in Sweden and in other countries, Stockholm nowadays has a higher proportion of highly educated people than in the past (Table 2). The proportion having a low educational level drops from 22% to 13% over the 1990–2010 period. The trend is general in the sense that residents in almost all tenure forms in all geographical segments are more highly educated in 2010. The magnitude of change is, however, far from similar; in the inner city the proportion was halved from an already low level (from 16% to 8%) while the reduction was modest from

a much higher level in the outer city multifamily housing areas (down from 34% to 28%). Among those residing in private rental housing in these areas, the proportion of people with less education is the same in 2010 as it was in 1990.

Ethnic restructuring

Much of the above socio-economic change occurs in a context of rapid population growth due to immigration from abroad. It is in fact necessary to study socio-economic polarisation and segregation by including the ethnic dimension. Immigrants, and especially the many refugee immigrants that have dominated the influx since the 1970s, are highly concentrated geographically and – as transpires from the last two columns in Table 2 – non-western immigrants are in particular residing in the rental part of the multifamily housing segment. It is by no means so that all new immigrants are poor or have less education than native Swedes, but the average level of income and education is low for immigrants living in the immigrant-dense housing estates. Non-western, first-generation immigrants now constitute more than half of all working-age residents in the outer city multifamily rental housing segment (up from 23% to 56%).

Residualisation

The data presented above make it very clear: outer city multifamily housing neighbourhoods have become poorer and more immigrant dense over time. This, however, is not only a process confined to public housing but instead it seems to be occurring in all tenure types. This does not mean that tenure plays no role; it surely does. We discern a clear trend following the transformation of the inner city. The inner city is gentrifying and – as we will document below – conversions from rental to cooperative housing play an important role in this process. At the same time, a much reduced stock of public housing in other parts of the region is increasingly becoming residualised in the sense that income development among its residents lags behind, educational levels are lower than elsewhere and show no signs of catching up with the rest of the region, and the segment now has a very high proportion of refugee migrants who face tremendous problems finding jobs. We also see a 'spillover' of the relatively poor and of immigrants into other tenure forms in and around the large housing estates (see also Andersson, 2013). This might to some extent be part of a spatial assimilation process of those who have been successful in finding a job and securing an income, but it is probably also an effect of a rapidly shifting balance between supply and demand for rental housing. The number of rental dwellings decreases while the city year by year expands its population. This by necessity requires that more people buy their dwellings. This includes those who would not usually compete to buy a cooperative dwelling but have no other choice (if they want to remain in Stockholm city).

Tenure conversions in Stockholm

Our next research question is whether it is the conversion of public housing into cooperative housing that contributes to gentrification in inner city Stockholm. Considering the fact that cooperative housing is a market commodity and that residents in the cooperative sector on average earn more money than those residing in public housing, it might look as if the research question has a simple and straightforward positive answer. However, there are many doubts concerning housing allocation within the public sector and some have argued that informal, second-hand contracts were common, that contacts played a crucial role for obtaining a contract – especially in attractive locations – and that the tenants in inner city public housing anyhow were middle-class people, who paid low rents for attractive housing (see, for example, Millard-Ball, 2000). If this is the case, tenure conversion would probably not result in gentrification. Millard-Ball (2000) also argues that tenure conversions by the late 1990s had not been a major factor in explaining gentrification in Stockholm. He also suggests that mechanisms operating within the rental sector, such as 'luxury renovations' and indeed the housing allocation process, are more significant contributing factors in the Stockholm case. However, a more recent study on the socio-economic and demographic effects of tenure conversions of housing in inner city Stockholm indicated that conversion of rental housing into cooperatives could indeed be regarded as nourishing a gentrification process (Magnusson, 2006). Individuals with higher disposable incomes and higher levels of education were found to replace less affluent individuals, and younger individuals were replacing the elderly. The results of this latter study also confirmed a back-to-the-city movement among families with children.

We aim to shed more light on this issue by analysing who lived in the public housing properties before the conversions, immediately after the first round of conversions were completed, and finally 6 years thereafter. We focus on conversions made between 1995 and 2002 and follow the composition of residents in all converted and non-converted properties until 2008. We focus on key demographic and socio-economic attributes of the residents: age and household composition, ethnicity, employment, educational level, income from work, and disposable income.

It is of course not easy to identify the precise role of tenure conversions for the gentrification process. Inner city Stockholm has been gentrifying for quite some time (Millard-Ball, 2000) partly because of a gradual shift in the industrial structure, resulting in the expansion of middle-class occupations (Borgegård & Murdie, 1993; Hamnett, 1994). The restructuring of older working-class-dominated neighbourhoods has occurred parallel to conversions of former industrial land into newly built residential areas (like Hammarby Sjöstad south of the city centre). The proportion of highly educated has increased in the city, following a more general trend in Sweden as a whole. The type of empirical material we possess makes it possible, however, to look more in detail at population compositional changes in the specific

properties and neighbourhoods affected by tenure conversions and to compare these with changes in the non-converted housing segment. This allows us to estimate the effects of tenure conversions while taking the overall socio-economic and demographic trends into account.

We have at our disposal a unique, longitudinal, register-based data-set comprising all individuals in Sweden who have lived in the country for any year between 1990 and 2008 (The Geosweden database). All individuals are geocoded so that their residential address is known for each year during this 19-year-long period. For the purpose of this study we have made a selection from this database of all residents who lived in Stockholm city in 1995, 2002, and 2008. The sample comprises 711,000 people in 1995, 752,000 in 2002, and 810,000 in 2008. Some have been residents in the city only for one of these years; others have been there throughout the period. We have for all 3 years attached data on each individual concerning demographic and socio-economic attributes (such as age, family type, country of birth, educational level, employment, work income, and disposable income). Combining the real estate and property register with the population address register we have attached information concerning the exact location of each individual (neighbourhood code (small area market statistics [SAMS]), 100 by 100 meter coordinates) and we have also identified all properties that were converted from public and private rental to cooperative tenure during the period 1995–2002.

Estimating the volume and geographical features of tenure conversions

The conversions from rental to cooperative tenure occur only in multifamily housing. In 1995, 573,000 people (80% of the total population) resided in multifamily housing in Stockholm city. More than 10% of these lived in properties that were affected by the conversions taking place between 1995 and 2002. Table 3 shows that tenure change and change in type of ownership occur not only in public housing but even more frequently in the private rental segment owned by limited companies. In fact, 27% of all properties owned by a private rental company in 1995 were sold to cooperative associations between 1995 and 2002, reducing the number of private rental properties from 1908 to 1549. This can be compared with the corresponding conversions from public rental housing to cooperatives, which amounted to 14%.

The number of properties owned by any of the three municipal housing companies in Stockholm city declined from 2014 to 1656, reducing the number of public housing residents from 222,000 to 177,000 (between 1995 and 2002). While the primary reason for private rental companies to sell to cooperatives is strictly commercial and profit driven, the conversion of public housing is ideological in character. All three public housing companies were profitable and had a reasonable mix of properties across Stockholm city. This allowed (in theory at least) households to relocate from outer to inner city, in accordance with their changing position in the

Table 3. Ownership structure (in %) of multifamily housing properties in Stockholm city in 1995 and 2002.

Owner category, 1995	Owner category, 2002						
	Physical person	Limited company	Cooperative association	Municipal housing company	Other	Total (%)	Total (*N*), 1995
Physical person	75	10	12	0	3	100	2248
Limited company	6	62	27	2	3	100	1908
Cooperative association	0	0	94	0	5	100	2800
Municipal housing company	0	3	14	80	2	100	2014
Other	7	8	23	0	61	100	985
Total (%)	19	16	40	17	9	100	9955
Total (*N*), 2002	1861	1549	3955	1656	934	9955	

Source: The Geosweden database, Institute for Housing and Urban Research, Uppsala University.

life cycle and in response to labour market opportunities. It has recently been argued (Fahey & Norris, 2011) that many scholars underestimate the extent of State involvement in present-day housing by looking too narrowly at the contraction of social/public housing. They argue that part of the reason for this is a failure to see the role of self-provisioning in the household as a form of production. The incentives for sitting residents to form a cooperative and to buy a public housing property could of course be related to a wish to achieve more influence over housing management and to take on more responsibility (see, for example, Kleinhans & Elsinga, 2010); we judge, however, that for most, the reasons are mainly of a financial character (see also Holt Brook, Kinver, & Strachen, 2006 for the British right-to-buy case). This also explains why the vast majority of conversions took place in inner city neighbourhoods, where demand for housing is very high and prices have been increasing much beyond inflation rates for a very long period of time. The offers made were initially very generous and buyers could expect a fast capital gain by buying their dwellings. The situation was and is different in the outer city where the biggest share of public housing is located. In 1995, suburban public housing had 172,000 residents compared to 50,000 in the city centre. In the suburbs, many public housing estates are clearly less attractive. Many have a majority of recently arrived immigrants, residents are frequently unemployed, and income levels tend to be relatively low. Some areas are also heavily stigmatised. Many of these suburban estates were built in the 1960s and 1970s and will face heavy reinvestments in the years to come with uncertain effects on the economy of any newly formed housing cooperative in these areas. It is therefore logical that the offer to form cooperative

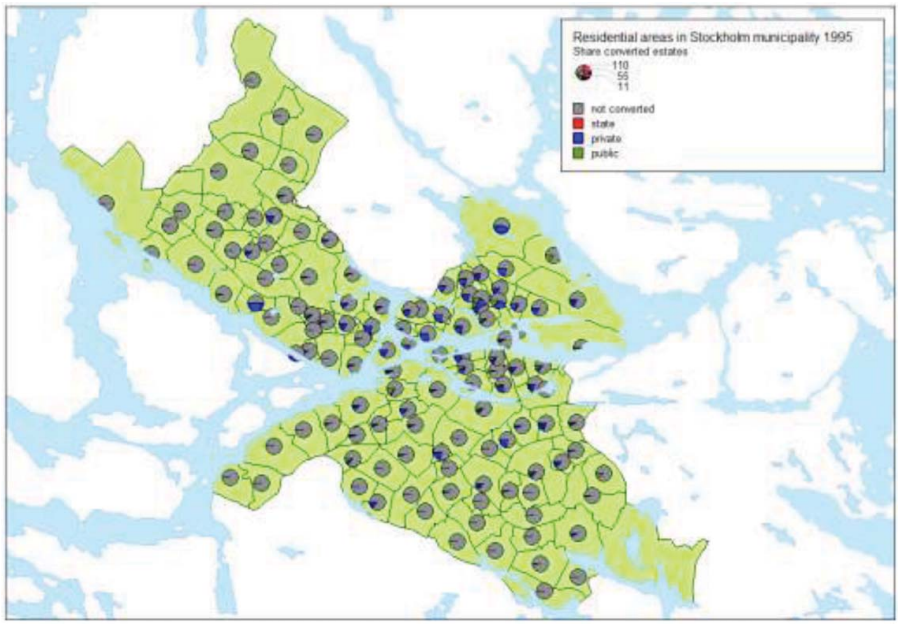

Figure 3. Conversions from rental to cooperative housing per neighbourhood in Stockholm city from 1995 to 2005.
Source: The Geosweden database, Institute for Housing and Urban Research, Uppsala University.

associations and to buy was rejected by a majority of these residents. Figures 3 and 4 give geographical overviews of the conversions taking place.

All in all, 61,000 out of the 711,000 people living in Stockholm city in 1995 resided in rental dwellings that were affected by conversions from rental to cooperative tenure taking place between 1995 and 2002. Density increases in the converted dwellings over time so at the end of the conversion period 64,000 lived on these properties, and 67,000 lived there in 2008. Roughly the same proportion (35%) of all tenants affected by the conversions from rental to cooperative tenure lived in private and public rental housing (see Table 4).

We lack information on purchase prices but we can compare taxation values for converted and non-converted properties. Such analyses indicate that converted properties have a higher average value, which confirms the suspicion that the most attractive properties have been converted (Magnusson & Andersson, 2008). Conversions primarily affect buildings constructed before 1945 and after 1990. Converted public housing properties were predominantly located in neighbourhoods already dominated by cooperative housing. In 1995, less than 10% of the

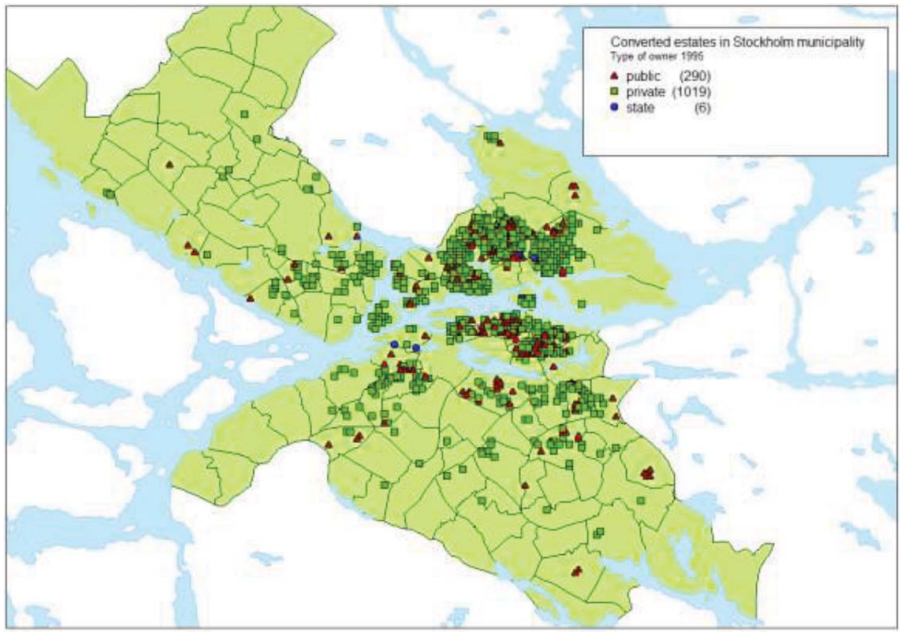

Figure 4. Conversions from rental to cooperative housing per estate in Stockholm city from 1995 to 2005.
Source: The Geosweden database, Institute for Housing and Urban Research, Uppsala University.

tenants affected by conversions resided in neighbourhoods having a majority of public housing residents. The conversions therefore did not contribute to making affected neighbourhoods more tenure mixed; on the contrary they reinforced the concentration of cooperative housing in inner city Stockholm.

Compositional effects

Let us start by describing how the composition of people in the converted and non-converted properties in Stockholm city has developed over time. We present educational and income data for 1995, 2002, and 2008. In order to economise on space we leave data on age and household composition out from this overview but will include this aspect when considering the post-conversion dynamics later on in the analysis. It should, however, be said that differences with respect to age and household profiles are relatively small between those residing in converted and non-converted properties.

Table 4. Number of people living in multifamily housing in 1995 per ownership category and number and percentage living in converted rental housing from 1995 to 2002.

Ownership	No. of residents	Percentage	Converted, 1995–2002	Percentage	Percentage living in converted
Unknown	562	0.1	61	0.1	10.9
State	114	0.0	36	0.1	31.6
Municipality	42	0.0			
Church	454	0.1	13	0	2.9
Physical person	71,233	12.4	7915	13	11.1
Decedent estate	1846	0.3	274	0.5	14.8
Limited company	86,672	15.1	21,653	35.6	25.0
Cooperative association	152,635	26.6			
Public housing company	220,408	38.5	21,456	35.3	9.7
Other	39,098	6.8	9366	15.4	24.0
Total	573,064	100.0	60,774	100.0	10.6

Source: The Geosweden database, Institute for Housing and Urban Research, Uppsala University.

Gentrification is normally found to go hand in hand with an upgrading of the average level of education in affected neighbourhoods. Figure 5 reveals that this is indeed taking place in Stockholm but also that the proportion of highly educated has rapidly increased throughout the entire city. However, while the difference in the tertiary-level education of residents before conversions (1995) was a modest 5%, the gap between those living in converted and non-converted properties increased to 15 percentage points in 2008.

Gentrification tendencies are perhaps even more evident when we focus on income development in the converted and non-converted segments. There were no income differences between inhabitants residing in the two segments in 1995 (before conversions). They are significant already in 2002, probably because of the selective migration occurring during the conversion phase and in some cases soon thereafter (note that some conversions took place already during the first part of the 7-year period 1995–2002); discrepancies were even more significant in 2008 (see Figures 6 and 7).

Comparing the composition of households and individuals over time reveals that gentrification is indeed taking place. Converted properties now have a typical middle-class character, comprising relatively young, well-educated, and well-paid inhabitants. It is likely that this rapid change in population composition is due to selective migration and a new market-based sorting of households. By selective

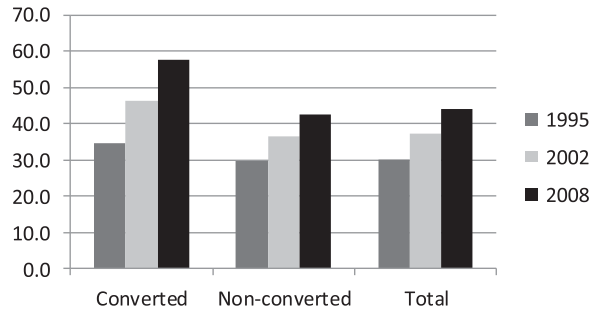

Figure 5. Percentage highly educated (tertiary level) in converted and non-converted properties in 1995, 2002, and 2008.
Source: The Geosweden database, Institute for Housing and Urban Research, Uppsala University.

migration we mean that those moving out differ demographically and socio-economically from those moving in. The next section presents a more in-depth analysis on this topic.

Post-conversion dynamics

Cross-sectional analyses can be informative but they are not able to give an accurate account of the underlying causes of a particular change in population compositions. We decompose trends by not only comparing those living in converted and non-converted properties but also by studying the characteristics of those moving in and out of converted properties.

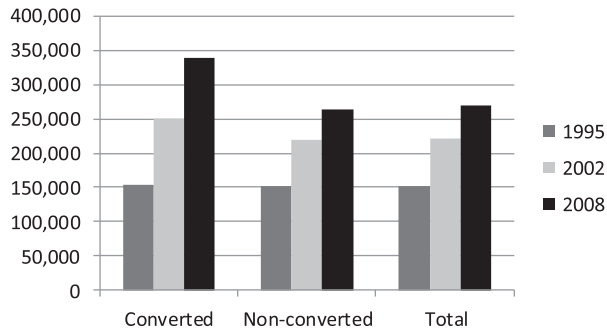

Figure 6. Average work income (SEK) in converted and non-concerted properties in 1995, 2002, and 2008.
Source: The Geosweden database, Institute for Housing and Urban Research, Uppsala University.

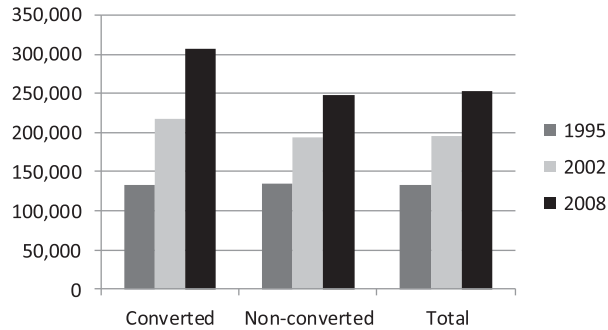

Figure 7. Disposable income in converted and non-converted properties in 1995, 2002, and 2008.
Source: The Geosweden database, Institute for Housing and Urban Research, Uppsala University.

Table 5 presents some key characteristics of both private and public rental converted properties. During the 6-year follow-up period more than half of the 2002 inhabitants in the converted estates had left the dwelling. Those staying put were older and earned more income compared to those who moved out. However, the big gentrification effect comes from substantial differences between those leaving and those moving in. The latter category is clearly younger, earns much more income, and has a higher educational level. These trends are similar for properties converted from private and public rental housing but they seem to be even stronger for the latter. Individuals leaving converted public housing between 2002 and 2008 earn much less money than both the stayers and those replacing them; they have a lower employment rate and comprise a lower proportion of people with a university education.

Table 6 reports outputs from a binary logistic regression analysis comparing out-movers and stayers from 2002 to 2008 in converted public housing properties. We confine the analysis to people aged 26 and above, estimating the risk of moving out compared to staying put. The odds quota (shown in the Exp(B) column) for leaving is clearly related to level of disposable income in 2002. Those having the lowest incomes (reference category in the analysis) are much more likely to be among those who exit the converted properties. Furthermore, education – which is important when comparing in- and out-movers – is not really a significant indicator for who leaves and who stays. Furthermore, those who are employed are somewhat less prone to exit compared to the non-working population. Foreign background is not significant when socio-economic and demographic attributes are controlled for. Like always, when migrants are compared with non-migrants, age turns out to be a strong dividing factor. Being above 34 in 2002 radically reduced the chances of moving out compared to being in the 26–34 age group.

Table 5. Key data on stayers and those moving in and out of converted properties in 2002–2008.

	Converted from private rented to cooperative			Converted from public rented to cooperative		
Socio-economic and demographic characteristics	Stayed, 2002–2008	Moved out, 2002–2008	Moved in, 2002–2008	Stayed, 2002–2008	Moved out, 2002–2008	Moved in, 2002–2008
Average age	43	36	31	46	36	29
Average disposable income age 20–64 (SEK)	239,000	210,000	315,000	277,000	187,000	296,000
Average income from labour age 20–64 (SEK)	262,000	238,000	354,000	299,000	194,000	343,000
Employment rate age 20–64 (%)	82	79	85	75	75	86
University education age 20–64 (%)	57	56	67	49	48	67
Foreign born (%)	11	12	14	14	15	13
Individuals in families with children (%)	20	17	22	33	25	29
Age 65+ (%)	15	11	3	19	11	3
Total *N*	18,062	24,188	27,012	10,658	11,299	11,494

Source: The Geosweden database, Institute for Housing and Urban Research, Uppsala University.

Table 6. Binary logistic regression on the risk of moving out, from 2002 to 2008, from dwellings converted from public housing to cooperative tenure 1995 to 2002.

	B	S.E.	Sig.	Exp(B)
Disposable income, 2002, quartile 1 (ref)				
Disposable income, 2002, quartile 2	−.350	.051	.000	.705
Disposable income, 2002, quartile 3	−.300	.058	.000	.741
Disposable income, 2002, quartile 4	−.252	.061	.000	.777
Not university education, 2002 (ref)				
University education, 2002	−.062	.037	.090	.940
Not employed, 2002 (ref)				
Employed in 2002	−.203	.053	.000	.816
Not couple with child(ren), 2002 (ref)				
Couple with child(ren), 2002	−.207	.040	.000	.813
Age 26–34 in 2002 (ref)				
Age 35–64 in 2002	−1.232	.043	.000	.292
Age 65+ in 2002	−1.328	.065	.000	.265
Swedish background (ref)				
Foreign background	−.040	.042	.344	.961
Constant	1.427	.060	.000	4.168
Log likelihood				20,579
Nagelkerke R2				.094

We can only speculate about the reasons for the strong socio-economic and especially income selection found here. One reason may be that those who sell their newly converted dwellings are seeking to capitalise on their capital gain in order to compensate for more modest incomes. Of those leaving, two out of three stay in Stockholm city and the majority (60%) move to either home ownership or another cooperative dwelling (table not included). In total one-third of those leaving recently converted dwellings move to the rental segment, predominantly into private rental housing, if they choose to stay in the city. Both categories of out-movers have likely capitalised on their gain. Despite the fact that they are replaced by households with more resources one cannot conclude that they are all losers, and there is another possible and competing explanation as to why out-movers are poorer than stayers. It is likely that many of those leaving, especially among those moving back to rental tenure, were in fact those who did not want to buy or were not accepted as mortgage customers; many tenants ended up renting their flats even

after the conversion of a property. They were then renting from the cooperative and not from a private or public landlord. These 'remaining tenants' have been much discussed in the media and political debate but we lack information about the number and distribution of such residents (we know the tenure of properties but not of particular residents/dwellings).

Conclusions

The empirical analyses that we have presented indicate that conversion of tenure has speeded up and reinforced the gentrification process in inner city Stockholm. Individuals with higher disposable incomes and higher levels of education are replacing individuals with fewer resources. Younger households are replacing the elderly and therefore the gentrification process also implies a back-to-the-city movement among families with children (see also Glaeser & Shapiro, 2003).

We have also shown that there is a social polarisation process going on within the public housing sector. It is highly probable that the conversions taking place after the 2006 shift in government have further reinforced this tendency. As shown in the 1990–2010 data analysis, there is presently very little public housing left in the inner city and those living in inner city, non-converted public housing have more resources than those living elsewhere. As shown by Bergsten and Holmqvist (2013, p. 299), new housing construction in Stockholm does not contribute to making residential areas more socially mixed and the conversions of former public rental housing into market-based cooperative housing further contributes to the segregation of the capital city.

The conversions of private rental housing into cooperative tenure are important parts of the gentrification process and these conversions would in themselves have led to a compositional shift of the inner city population. Conversions from public rental housing have been carried out on ideological grounds and have clearly contributed to making inner city Stockholm less socially mixed. For the sitting tenants, a conversion can generate a substantial profit as the conversion price in attractive locations tends to be set below market price. Unfortunately, the conversion of public housing into cooperative housing also reduces the public sector, increases segregation, and generates less affordable housing in Stockholm for those who cannot access cooperative or home ownership tenure.

What about the future of public housing in Stockholm? The past 20 years have seen politically initiated changes that have altered the function of Swedish public housing in general and Stockholm's public housing market in particular. It is not very probable that a shift of national and local governments will lead to a restoration of this tenure in its traditional form. The national housing policy has more or less vanished and what is left is a decentralised housing policy controlled by local governments. For the foreseeable future it will be the political ideologies of these local governments that will locally decide the future of particular public housing

companies as well as how to address and counteract residential segregation (Andersson, Bråmå, & Holmqvist, 2010). Problems will be most evident in metropolitan regions where functional regions comprise 10, 20, or sometimes 30 individual municipalities. In the absence of institutional coordination in the form of strong regional governance, they all tend to pursue their own housing agenda (keeping and attracting the middle class) and it is highly probable that this will lead to severe under-investments in (at least affordable) rental housing, making these regions less flexible and potentially less attractive.

In terms of segregation, it is not a wild guess that Sweden, characterised by small, social-class differences at the household and earlier also the neighbourhood level, will experience even stronger segregation tendencies. It is interesting to note that while reforms targeting the labour market are always carefully evaluated, the political interest in evaluating even radical housing policy reforms seems to be completely lacking. This will make the role of independent and critical housing research even more important in the coming years.

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