



Why are some families with children leaving the inner city and other staying?

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Abstract

Around 70 percent of those born in the inner city of Oslo move away before reaching school age despite the municipal goal of keeping more of them there, for example by securing a certain share of new construction of larger dwellings. In this study, we investigate to what degree this out-mobility is a question of preference for suburban attributes and to what degree some of those moves are a result of a combination of low income and high house prices. A highly deregulated Norwegian housing market makes it difficult to achieve an acceptable housing standard in centrally located areas of the city. Based on a comprehensive survey and a logistic regression analysis where out-movers are compared with a group of stayers in the inner city, we find that typical movers are attracted by the attributes of suburban living. Stayers prefer short distances to work, desire to live close to friends and appreciate the ability to walk or cycle to different activities. Particularly among movers to Oslo outer east, we find households with lower incomes, lower education and with a relative high share of country background from Africa and Asia. Many of them would have preferred to stay in the inner city if they could have afforded a decent home there.

Keywords

residential mobility, housing and location preferences, families with children

Introduction

In some larger cities, an increasing number of children are born in the inner city. A normal pattern is the outmoving of young families with children under school age. This pattern can still be observed, but, simultaneously, a high number of families with children choose to live in the inner city. Of those born in the inner city of Oslo, about 70 percent leave before they reach school age (Stambøl, 2013). Wessel and Bjørnson Lunke (2021) compared two cohorts of first-time parents from 1995 and 2005 and found that the proportion of parents who remain in the inner city of Oslo had decreased and that they more often than before moved to low-rise houses.

Generally, suburbs have undergone major changes over the last century. From being home to a small number of wealthy people, they became an attractive location for a growing middle class. Closest to the city centre, a mix of blocks and houses with few dwellings dominated; on the fringe there were contiguous areas of single-family houses (Balasarre, 1992). In-between these areas, enclaves of older, poorly maintained, dense developments quite near the metro and train stations emerged. These developments easily attract low-income households and immigrants (Hochstenbach & Musterd, 2017; Tzaninis & Boterman, 2018).

Couple formation and the birth of a first or second child increase space requirements and are often accompanied by a move to the suburbs (Rossi, 1955; Tzaninis & Boterman, 2018). Those leaving the inner city associate suburbs with being appropriate for bringing up chil-

dren, a better quality of life, lower density, reduced noise, a slower pace of life and lack of crime (Gkartzios & Scott, 2010). Suburbs offer more spacious, more affordable, and more owner-occupied housing, and so moving is also a question of price and tenure (Booi et al., 2021). For many families with children living in the inner city, who need more living space, there will often be a trade-off between lower house prices in the suburbs, better possibilities for increasing living space, and longer distances to work, often for two working adults.

The concentrated mass development of housing in the 1950s and 1960s was a qualitatively good alternative for the inner-city inhabitants of Oslo who were living in overcrowded homes of a poor standard (Hansen & Brattbakk, 2005). These satellite cities were, for historical reasons, developed in outer-east areas of Oslo (Myhre, 2016). House prices there today partly reflect the distance from the city centre and partly the dense settlement between noise-deferred entrance roads from the rest of Norway, enhanced by a high share of low-income households and non-western immigrants in owner occupation, who were attracted by the initially low house prices (Barlindhaug, 2016). Oslo has been shown to be a divided city, with the low-priced satellite cities in the outer east having a high share of non-western immigrants. The outer city west, with its high share of low-rise houses and a much higher price level, attracts those who are wealthier (ibid.). In the nearby county of Akershus, the housing stock does not vary so much between the eastern and the western municipalities, but the price level does.

The relocation of manufacturing industries from central parts of cities, to both the suburbs and abroad, and a growth in the service sector, has made the inner city more attractive and gentrified (Kabisch et al., 2019). Many of those poorer inhabitants in the inner city, who previously had no opportunities to obtain better housing conditions in the suburbs, have been replaced by medium and high-income households. In Oslo, high-income households move partly into upgraded older developments and partly into newly built brownfield projects (Barlindhaug, 2003; Sæter & Ruud, 2005). Almost 60 percent of the residential construction in Oslo over the last 15 years has taken place in the inner city, especially the inner-city east, partly as densification and partly as brownfield development, with strong emphasis on waterfront projects (Barlindhaug, 2016; Barlindhaug & Nordahl 2018). This is the main reason why the population growth has been higher in the inner city than in the outer city of Oslo, in contrast to many big cities in other countries (Tzaninis & Boterman, 2018).

The latest master plan for Oslo expresses that facilitating families' housing careers in their own urban district, with variation in house types and dwelling size, is important (Oslo Municipality, 2018). One of the instruments has been establishing a norm for the composition of new build dwellings according to size in the inner city. Having a certain share of large dwellings in each new housing project in the inner city does not, by the way, guarantee that families with children will be able to afford to buy them. In some other cities, an explanation for out-mobility of families with children is that there are too few large, owner-occupied dwellings in the inner city (Booi et al., 2021).

Many studies of residential mobility focus on recent movers and how their motives for moving vary with life course and socio-economic characteristics. Some of these studies are limited to families with children, especially in an urban context where the choice of living in the city centre or in the suburbs is in focus. In this study, we have the possibility of comparing families with children who have moved from the inner city to the suburbs with families in the same life course who have chosen a more permanent stay in the inner city, based on a large survey of these two groups. Our focus is to illuminate to what degree these two groups have different housing and location preferences and to what extent some of the movers are so-called displaced movers, resulting from not having enough economic resources to reach a

satisfying housing standard in the central part of the city. In the event that the main explanation is that movers have other housing and location preferences than stayers, it could be difficult to find instruments for keeping a higher share of families with children in the inner city.

In the next section, we give an overview of the literature on residential mobility, with a focus on families with children. Then follows a closer description of the characteristics of the Oslo region. The remaining sections outline the data, method used and then the results. The article ends with a conclusion and a discussion.

Residential mobility, urbanisation, and re-urbanisation

In the literature on mobility, there is a distinction between intra-urban and inter-urban mobility, where the latter is called migration or long-distance moving, often triggered by job-related or “human capital” reasons (Li & Tu, 2011). Theories of intra-urban mobility are rooted in sociology and geography disciplines, where the focus is on dissatisfaction with the original location triggered by life cycle changes (Li & Tu, 2011). Later, economists tried to model the decision-making process using neo-classical, micro-economic senses of utility maximisation on housing consumption mismatch resulting from an unexpected economic or demographic shock. This tradition also included a wealth effect, the effect of mortgage constraints and risk aspects connected to transactions in the owner-occupied sector (*ibid.*). Many studies stress the importance of seeing the demand for housing as a joint mobility-tenure decision.

Much of the literature on residential mobility departs from individuals going through different life stages (Rossi, 1955). Housing needs change with life stages, and dissatisfaction will trigger moves and adjustments in housing consumption. These adjustments can be related both to housing and neighbourhood characteristics in addition to accessibility. Behind the judgements of existing and desired housing consumption are changes in personal economy, births, and changes in marital status (Clark & Huang, 2003). In addition, there may exist some push and pull factors connected to the existing and future neighbourhoods. The actual move is also influenced by income, wealth, and the housing market structure, especially when changing tenure to owner-occupation (Clark & Onaka, 1983; Clark & Lisowski, 2017; Gkartzios & Scott, 2010; Booi & Boterman, 2020). Families with children adjust their housing consumption according to the number of children, age of children and economic resources. Location is also a question of housing supply in the form of price, size, and tenure (Booi et al., 2021).

There is quite some evidence that people will move back to, or near to, the place they grew up when they want to settle down (Feijten et al., 2008). But it is also the case that those coming to the city for education and work typically stay for quite some time. Having invested in a social network in the city, often established in the period before having children, is a reason for staying in the inner city and making it a permanent living area (Karsten, 2003; 2007).

Mulder (2007) sees location as a question of living close to family, but location usually strongly correlates to house prices. For high-income households, there are two forces drawing in opposite directions. Rich households want larger homes and are attracted by lower housing prices in the suburbs. Simultaneously, their opportunity cost of time influences commuting costs. Brueckner et al. (1999) assume that the ratio of commuting cost to housing consumption falls with income, which leads to wealthy households to locate in the suburbs. Preferences for location also vary with socio-economic variables. When a centre has strong amenity advantages over the suburbs, wealthy households are more likely to live in central locations. Amenities in the centre can then pull affluent households towards

it. This model is used to explain why high-income residents in US urban areas tend to live in suburbs and that these income groups tend to live more centrally in Europe (Flambard, 2017).

Flambard (2017) finds that an increase in income, age, size of household or housing cost to income ratio increases the probability of being an owner of a house in the suburbs. In some of the cities studied, amenities in the city centre make up for a less spacious dwelling and make households, to a larger degree, prefer to locate themselves in the inner city. Cities where most suburban inhabitants drive their car to work on free highways prefer to locate in suburbs. Mulalic and von Ommeren (2017) show that an average household in Denmark who had a doubling of income will reduce the distance from home to workplace from 18 to 16 kilometres.

Some families with children continue to stay in the city because population density, good amenities, and public transport, in addition to a tolerant atmosphere, random encounters and small shops, still attract them (Lilius, 2014). Those who choose to stay may also have special perceptions about life in suburbs being boring, with high social control, less tolerance for deviation and less supply of goods and services (Danielsen, 2005). Boterman and Bridge (2015) find that if a household's best friends locate in the inner city, the probability of moving out is reduced. If many families with children decide to move, the children of some of the intended stayers would lose their friends in school, kindergarten and in the neighbourhood. This could also function as a driver for some of these families to move.

Often, the most attractive cultural events happen in the inner city, where the level of cultural diversity is also highest. Households with low cultural capital and high economic capital are the ones who most often move out of the inner city, while stayers have high cultural capital and low economic capital (Boterman, 2012; Boterman & Bridge, 2015). Families with children are usually negotiating between what is the best area for bringing up children and the adults' preferences concerning commuting to work, access to an established network of family and friends and easy access to different cultural arrangements.

Families with children moving out of the inner city can be divided into ex-urbanists, displaced urbanists, and anti-urbanist movers (Mitchell, 2004). Ex-urbanists want to live close to the city and to maintain contact with it through work, cultural and social events, and prefer better and bigger housing within reasonable commuting distance. Anti-urbanists will escape the supposed negative effects of the city, while displaced urbanists do not want to leave the city but feel financially forced to move and leave with a feeling of regret (*ibid.*).

Gkartzios and Scott (2010) studied counter-urbanisation floods in the Greater Dublin area and found that the main motives for moving to rural areas were living in better, larger, and cheaper houses and that these areas were the most appropriate for bringing up children. Rural areas were also associated with a better quality of life, lower density, reduced noise, and there was a slower pace of life and lack of crime. The pull factors dominated in explaining the move, especially the social environment in rural areas but also the physical environment and lower house prices. Bergström et al. (2010) find that households with children most likely move to areas where there are many similar families, partly because that is where they find the largest houses and partly because they want to live with other families with children.

Residential location and school choice among families with children is seen as a simultaneous decision, especially in countries like Norway where location determines which public school the children in elementary school belong to (Ely & Teske, 2015). The quality of the school, the distance to it, the mix of pupils and the safety of the route are of importance. In Oslo, a high share of minority pupils in school creates more worry than a high minority share in the neighbourhood (Hewitt, 2013). School quality can be capitalised upon

in house prices, reducing low-income households' access to neighbourhoods with higher quality schools (Machin & Salvanes, 2016). Good school quality can be based on rumours. Grades can say something about educational standards of a school and, perhaps most, who the pupils are. Meanwhile, indicators measuring the contribution to the actual quality of the school are more independent of the mix of pupils, one example being measuring the degree to which average grades improve over a period of time. In contrast to earlier research, Cuddy et al. (2020) find that the freedom to choose both school and residential location could be more imaginary than real and that other attributes are more important in the location decision.

The Oslo region

The urban districts in Oslo municipality are divided into four areas according to east/west dimension and centrality, as shown in figure 1. Oslo outer city west had around 182,000 inhabitants in 2017 and Oslo outer city east nearly 230,000. The former county of Akershus is split into two parts. The western part consists of the municipalities Asker and Bærum and has nearly 185,000 inhabitants. The remaining municipalities lie in Akershus east, which constitutes about 420,000 inhabitants. Many of the municipalities in Akershus east are further away from Oslo than the two western municipalities.

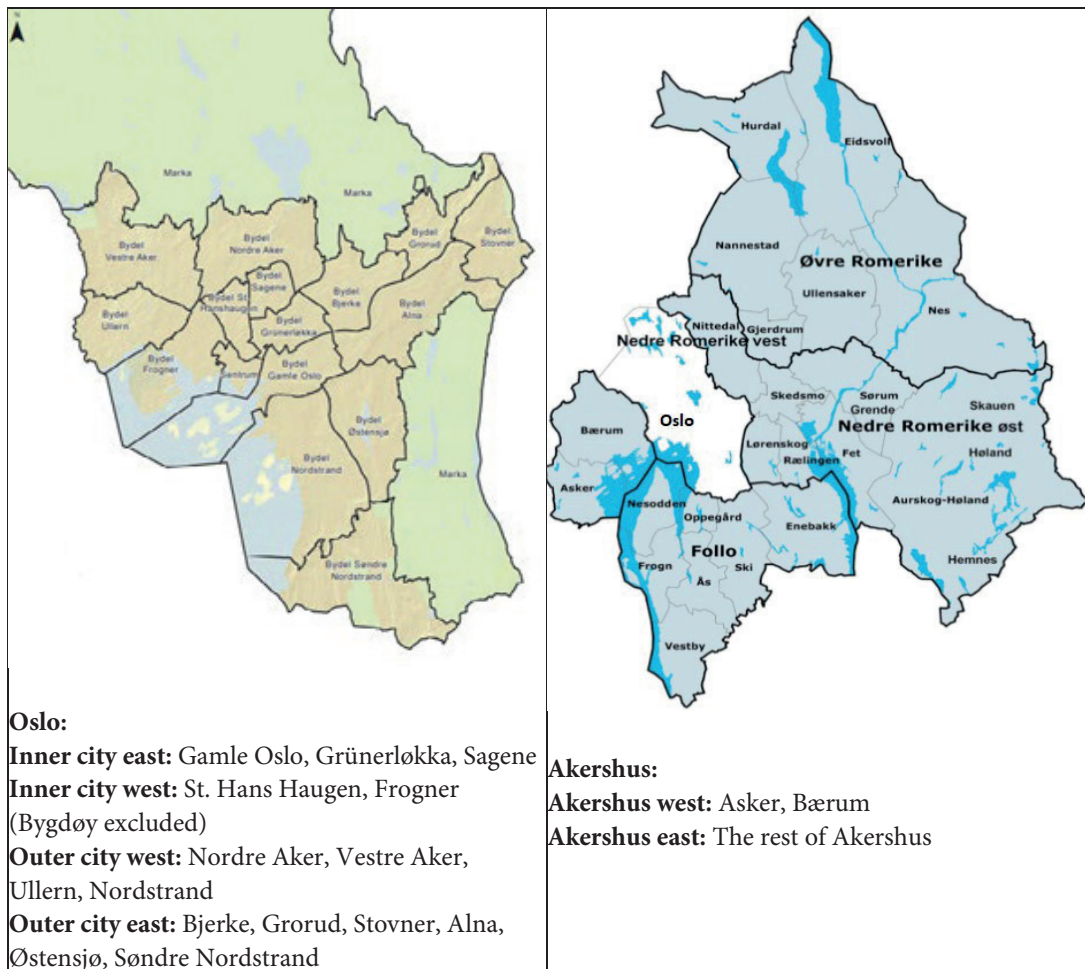


Figure 1
 Urban districts in Oslo and municipalities in Akershus

After World War II, the population in Oslo increased but was strongly reduced in the inner city as high housing construction in suburbia led many families to move away from the overcrowding and poor housing conditions. During the 1970s and 1980s, the total population in Oslo was diminishing before enjoying strong, continuous growth.

Figure 2 shows the development in the child population of the inner city between 2004 and 2020. Around 70 percent of the children in the inner city live in inner city east and constitute a higher share of the total population there than children in inner city west: 13 percent and 9 percent respectively. In addition, figure 2 shows the share of each birth cohort that has moved out of the inner city within the first six years, i.e., before school starts.

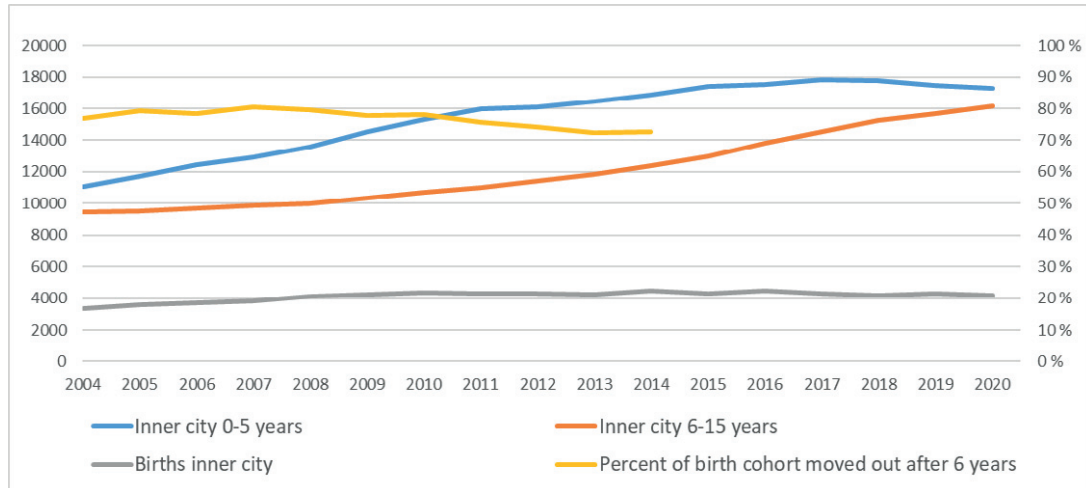


Figure 2

Births, out-migration rates, and child-population in Oslo inner city. 2004–2020

Source: Statistics Norway/microdata.no – own computations, Oslo municipality statistic bank

Both age groups exhibited strong growth during the period – a result of births and net out-migration. The number of births grew in the first half of the period and have thereafter been stable at slightly over 4,000 per year. The high number of births is mainly a result of a strong increase in young, single people moving to the inner city for education and work who later form couples and have babies (Ogden & Hall, 2000; Booi & Botermann, 2020). Children born in the inner city in 2007 showed the highest out-mobility among the 2004–2014 birth cohorts: 81 percent left after 6 years. This share was reduced to 72 percent for the 2013 and 2014 birth cohort. The lowest level was in the urban district of *Gamle Oslo* and the highest in the urban district of *Sagene*. In Helsinki, there has also been an increase in the number of children under six years of age, but there it is explained by a reduction in moving out of the city (Lilius, 2014).

Compared to the out-migration, the in-migration of children to the inner city of Oslo has been considerably lower. Those of six years of age living in the inner city, and born outside, constituted a little more than 15 percent of those born in the inner city six years earlier (Stambøl, 2013).

The age group 0–5 years seems to reach a peak around 2017 in the inner city of Oslo, while the age group 6–15 years is steadily increasing. The number of children aged 0–5 years grew by 58 percent in the period 2004–2019, while the total population in the inner city increased by 51 percent. The age group 6–15 years increased 67 percent in the same period.

House price differences between the inner city and the suburbs, as well as travel expenses and time spent on travel between home and work will influence the choice of staying or

moving. In figure 3, we see the lowest house price level in the eastern part of Akershus and the highest in Oslo inner west.

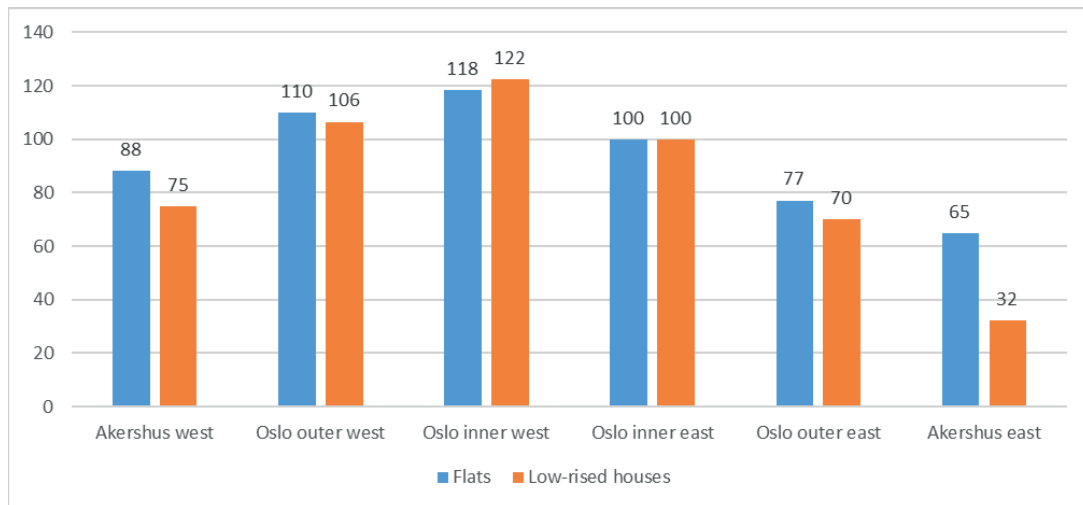


Figure 3

House price level in the Oslo region in 2014. Index: Oslo inner east = 100

Source: Data from finn.no from 2013 and 2014.

Own hedonic price analyses, controlled for house type, size, construction year and sales year.

Data and method

This study is based on results from a survey undertaken in 2018 among households with children aged 0–10 years who, in the period 2014–2017, were moving from the inner city to Oslo’s suburbs or to the surrounding county of Akershus. A group of families who had stayed in inner city for four years or more with children aged up to 14 years in 2018, and who did not have moving plans, were contrasted to the movers. The response rate was 28 percent, based on 2,845 answers. Register data on age, sex, country background and moving year were available for the gross sample.¹ Based on these variables for the gross sample, weights were constructed separately for movers and stayers.

Only a few of the questions in the survey were similar for movers and stayers. These questions are used in the logistic regression analysis and shown in the appendix. Other questions from the survey, documented in Barlindhaug et al. (2018), are used to further illuminate the motives behind the decision to move or stay.

The questionnaire was partly related to motives and preferences for moving to the new dwelling, the new location, and the environment (pull factors). Another part of the questionnaire was related to motives and preferences for moving away from the former dwelling and location (push factors). Stayers were asked questions about motives and preferences for not having plans to move out of the inner city. In the analyses, we constructed explanatory variables representing the preferences of both movers and stayers (see table A1 in the appendix). These variables are based on the importance of pull factors among movers, and for stayers,

1. Country background is constructed based on information about the country of birth for three generations and refers to private, or the mother’s, father’s or grandparents’ foreign country of birth. For people born abroad, this is (with few exceptions) their own native land. For people born in Norway, this is their parents’ country of birth. In cases where the parents have different countries of birth, the mother’s country of birth is chosen. Source: <https://www.ssb.no/en/befolkning/innvandrerstatistikk/innvandrerstatistikk-og-norskfodte-med-innvandrerforeldre>

these variables are based on questions that express the importance for a future stay in the inner city. The importance of noise is one example; movers were asked about the importance of “low noise” in the area they moved to, while stayers were asked about the importance of “low noise” for not having plans to move. An interpretation problem can arise, and the results in the regression analyses must therefore be carefully interpreted.² Questions related to attributes that could easily be changed by moving inside the inner city were not used, for example which floor the dwelling is located on and whether or not it has a balcony.

Respondents who represented couples were divided into three household income categories with the same number of respondents in each category: those with low, medium, and high household incomes. The same division of single parents according to household income was made.

Results

A brief description of movers and stayers after moving direction, based on questions from the survey (Barlindhaug et al. 2018), is shown in table 1. The table shows the housing situation before and after the move for four types of movers in addition to the actual housing situation for stayers. We also see that the weighed distribution of movers from the survey is almost the same as the actual distribution of households with children who moved during 2017. The mobility data show that two out of three families who moved to Akershus east moved to a municipality that borders Oslo. Of the households with children moving from the inner city to Oslo outer city or Akershus, a lower share moved to Akershus east and a higher share moved in the other three directions compared to all other household types (not shown in the table).³

Table 1 Housing conditions of movers and stayers, before and after moving

	Inner city to Oslo outer west	Inner city to Oslo outer east	Inner city to Akershus west	Inner city to Akershus east	Stayers without moving plans
M ² floor area before	86 (43)	69 (26)	80 (26)	71 (21)	-
M ² floor area after	146 (66)	104 (46)	171 (71)	148 (59)	95 (43)
Share of low-rise houses, %					
Before	8	5	1	2	-
After	51	40	66	77	10
Owner-occupiers %					
Before	86	58	89	81	-
After	89	83	96	91	86
N=	579	530	239	292	1205
Movers only:					Sum
Weighted distribution (survey) %	31	33	16	20	100
Household moved from inner city %.*	32	33	15	20	100

(standard deviation) * All households with children who moved from inner city to Oslo outer city and Akershus during 2017. Source: Statistic Norway, Microdata.no

2. The whole questionnaire in Norwegian can be provided by contacting the author

3. Source: microdata.no

Movers to the suburban areas make a considerable square metre increase to their living space. In particular, those moving to Akershus moved to large dwellings. The survey showed that 70 percent of the movers indicated that the lack of a private garden or outdoor space was quite or very important for the moving decision and 55 percent cited play areas for children. Two out of ten reported that it was quite or very important for the moving decision that other families with children had moved (Barlindhaug et al., 2018).

Most of the movers were owner-occupiers both before and after the move, except for movers to Oslo outer east, where the home-ownership rate rose by 25 percentage points (up to 83 percent), close to the rate of stayers. For some households, high central house prices only make home ownership possible if moving in the cheaper easterly direction. Stayers had dwellings that were around 20 square metres larger than the dwellings left by the movers. One explanation of this difference is that movers probably needed a larger dwelling and had to decide whether to stay in the inner city or move out. From the survey, we find that 69 percent of the movers did not want to stay in the inner city because they thought it was quite or very important to move to a single-family house or a house with few dwellings. One third moved because it was quite or very important *not* to live in the inner city with children in school age. Half of the movers, many of them moving east, reported that economic resources or high house prices were quite or very important for not staying in the inner city (Barlindhaug et al., 2018). We also find that nearly 50 percent of the movers would have stayed if the central prices had been lower – a sort of spatial displacement according to Hamnett (2009).

In table 2 we present the frequencies on the independent variables in the logistic regression. The share of single parent households is relatively high among stayers. Movers, more than stayers, report that a safe living environment and play areas for children, low noise, and the opportunity to use a car for various activities are important. Stayers, more than movers, report that a stable school class environment, living close to friends and the opportunity to walk to different activities are important. Due to the sample procedure of movers and stayers, where stayers are supposed to have lived in the inner city with children for at least four years, stayers are somewhat older than movers.

In the following logistic regression analysis, only socio-economic factors such as age, household type, country background, education, household income and where the respondent grew up are used as independent variables in model 1. In model 2, we introduce preference variables that express the respondents' attitudes to (a) the residential environment for children, including school; (b) noise and pollution; (c) the importance of living close to family or friends; (d) the importance of the social environment and who the neighbours are and (e) the importance of different commuting alternatives to daily activities. In four additional models, we do separate analyses for movers in the easterly and westerly directions and divide them into movers to the Oslo outer city and movers to Akershus (east: models 3a and 3b, and west: models 4a and 4b). The group of stayers is the same in all models. Multicollinearity between independent variables was checked using the VIF-procedure in SAS. The model is tested for the following hypotheses: car use is more important for couples than singles, and school variables are most important for high income households, without finding significant results. Results from the logistic regression analysis are presented in table 3.

Model 1 shows that having low income slightly reduces the probability of moving compared to those with middle incomes. Families with country background from Africa or Asia move out of the inner city more often than others, while single parents stay to larger extent than couples. Time spent on travelling to work and taking children to school or kindergarten is an explanation of why single parents may be stayers (Booi & Boterman, 2020). Moving

out of the inner city decreases with age. Model 2 controls for a range of preference variables and shows the same or stronger explanatory power on the socio-demographic variables than model 1. As expected, movers place emphasis on more space, safe environment for children and absence of noise. They are family orientated and engaged in the opportunity of parking their car where they live. For stayers, it is important to live close to friends, and they place more emphasis on who the neighbours are and the opportunity of walking to different activities.

Table 2 Descriptive statistics on movers and stayers, after moving direction (shares)

	Inner city to outer west	Inner city to outer east	Inner city to Akershus west	Inner city to Akershus east	Stayers without moving plans
Before eventually moving – live in Oslo inner east (ref. west)	0.57	0.77	0.46	0.79	0.68
Low household income	0.16	0.48	0.09	0.36	0.28
High household income	0.46	0.16	0.53	0.22	0.37
Age in years (mean)	38 (5.5)	38 (6.5)	37 (4.6)	37 (5.3)	43 (6.7)
Country background from Africa/Asia	0.04	0.27	0.04	0.08	0.13
Single parent	0.08	0.17	0.05	0.09	0.24
High education (university/university college for more than 4 years)	0.67	0.39	0.64	0.50	0.55
Grown up in outer Oslo or Akershus	0.51	0.32	0.54	0.52	0.38
One bedroom for each child – very important	0.56	0.54	0.63	0.63	0.41
A safe living environment for children – very important	0.85	0.79	0.84	0.84	0.77
Safe play areas adjacent to the dwelling – very important	0.56	0.57	0.64	0.60	0.46
Safe way to and from school – very important	0.55	0.58	0.56	0.66	0.71
Stable school class environment – very important	0.54	0.47	0.41	0.49	0.59
Prop. of pupils in school who are native speakers of Norwegian – very imp.	0.25	0.29	0.20	0.21	0.25
Low noise – very important	0.35	0.37	0.30	0.38	0.29
Low pollution – very important	0.33	0.33	0.32	0.39	0.31
Closeness to the immediate family – very important	0.12	0.13	0.16	0.18	0.12
Closeness to friends – very important	0.07	0.08	0.03	0.02	0.23
Conditions of the social environment – very important	0.37	0.33	0.26	0.32	0.51
Who lives in the surrounding area/neighbours – very important	0.24	0.23	0.15	0.17	0.34
Opportunities to use a car for various activities – very important	0.19	0.15	0.23	0.22	0.15
Good parking facilities for cars – very important	0.37	0.33	0.46	0.44	0.21
Opportunities to use public transport for various activities – very imp	0.38	0.46	0.22	0.25	0.45
Opportunities to use bicycles for various activities – very important	0.26	0.20	0.19	0.21	0.37
Opportunities to park a bike where you live – very important	0.32	0.21	0.26	0.27	0.26
Opportunities to walk to different activities – very important	0.21	0.21	0.16	0.18	0.44
N=	579	530	239	292	1205

(Standard deviation)

Parents are aware of traffic in the inner city and try to find safe solutions for taking children to and from school. Stayers are asked if a safe way to school is an important reason for not moving from the inner city, while movers were asked if this was a reason for moving. A positive sign on this variable in the analyses may be the result of stayers more often living in areas of the inner city where the way to school is safe, while many movers did not.⁴ Another explanation is that movers often leave the inner city before school start and have not yet reflected on the topic.

In the next four models, we investigate how the preference variables vary with moving direction. The socio-economic composition of movers, reflected in income and country background, vary between moving directions. A comparison of movers in easterly directions and all stayers in the inner city shows that high income clearly reduces the probability of moving out of the inner city in this direction. Among movers in westerly directions, we find that low income strongly decreases the probability of moving, especially to Oslo outer west. This pattern also reflects the structure of the existing housing market, where the western side has considerably higher house prices and a higher share of single-family houses compared to the eastern side.

The importance of preference variables related to raising children are nearly the same when comparing movers to the east and movers to the west, but the strength of some of them vary between eastern and western movers. Among the variables increasing the probabilities of moving rather than staying, movers in the westerly direction put more weight on the importance of safe residential areas and play areas for children in addition to the importance of living close to family and the opportunity of walking to different activities. For movers in the easterly direction, the importance of one bedroom for each child strongly increases the probability of moving from the inner city.

Comparing movers to Oslo outer east and Akershus east, we more often find that low-income households from Africa or Asia locate in Oslo outer east. Movers in this direction are more often single parents, and they find school aspects and the use of a car for different activities important. Based both on the regression analyses and findings in Barlindhaug et al. (2018), movers in the easterly direction can be separated into two main groups. In the first group we find those who have strong preferences for small houses with private gardens and move far enough from the inner city to implement those preferences at an acceptable price. Movers in the other group report that they first looked for a larger dwelling in the inner city but that high house prices and their economic resources led to a more reluctant move to the outer eastern part of Oslo. There, they found a larger dwelling, but the desire to stay close to the city centre made them continue to live in flats. They expressed that this choice was a more preliminary solution than was reported among other movers. These two groups are quite similar to what Mitchell (2004) calls *ex-urbanists* and *displaced urbanists*.

High incomes among westerly movers put them in a position where they, more than others, have the opportunity of choosing to continue living in larger central flats or to move out of the city. They also reported that their chosen housing alternative was a more permanent housing choice in a situation with children (Barlindhaug et al., 2018).

4. In the survey, households in the inner city can be distributed across around 30 sub-districts. We find that out-mobility among families with children varies between both urban districts and the sub-districts inside each urban district.

Table 3 Logistic regression analyses of the probability to move out of the inner city with children, in contrast to staying

* p < 0.05, ** p < 0.01, *** p < 0.001

	Model 1		Model 2		Model 3a Oslo outer east		Model 3b Akershus east		Model 4a Oslo outer west		Model 4b Akershus west	
	B	Sig	B	Sig	B	Sig	B	Sig	B	Sig	B	Sig
Intercept	7.043		7.346		5.382		7.237		6.112		9.361	
Before evt. moving – live in Oslo inner east (ref. west)	-0.159		-0.168		0.368		0.311		-0.419	*	-1.083	***
Low income (ref. middle income)	-0.257	*	-0.451	**	-0.093		-0.256		-0.910	***	-1.586	***
High income (ref. middle income)	-0.045		-0.306	*	-1.015	***	-0.511	*	-0.019		0.232	
Age, years	-0.162	***	-0.176	***	-0.168	***	-0.224	***	-0.169	***	-0.253	***
Country background from Africa/Asia (ref. others)	0.467	**	1.031	***	1.464	***	0.495		0.109		-0.077	
Single parent (ref. couples)	-1.159	***	-1.039	***	-0.609	*	-1.477	***	-1.250	***	-1.545	***
High education	-0.058		0.065		0.168		0.131		0.235		-0.268	
Grown up in outer Oslo or Akershus (ref. other places)	0.130		0.048		-0.309		0.263		0.129		0.044	
One bedroom for each child – very important			0.599	***	0.808	***	1.081	***	0.373	*	0.577	*
A safe living environment for children – very important			0.792	***	0.933	***	0.294		0.890	***	0.735	*
Safe play areas adjacent to the dwelling – very important			0.346	**	0.349		0.140		0.253		0.829	**
Safe way to and from school – very important			0.339	*	0.618	**	0.559	*	0.199		0.339	
Stable school class environment – very important			0.255		-0.014		0.408		0.196		0.567	
Prop. of pupils in school, native speakers of No. – v.imp.			-0.604	***	-0.813	***	-0.018		-0.885	***	-0.489	
Low noise – very important			-0.312	*	-0.664	**	-0.597	*	-0.018		-0.718	**
Low pollution – very important			0.009		0.205		-0.261		-0.018		-0.270	
Closeness to the immediate family – very important			0.449	*	0.335		0.634		0.386		0.520	
Closeness to friends – very important			-1.473	***	-1.532	***	-2.177	***	-1.072	***	-1.648	***
Conditions of the social environment – very important			-0.383	**	-0.141		-0.291		-0.554	**	-0.395	
Who lives in the surrounding area/neighbours – v. imp.			-0.441	**	-0.568	*	-0.912	**	-0.089		-0.798	*
Opportunit. to use a car for various activities – very imp.			-0.300		-0.813	**	-0.132		-0.223		-0.239	
Good parking facilities for cars – very important			0.804	***	1.135	***	1.033	***	0.413		0.835	**
Opport. to use pub. transp. for various activities – v. imp.			-0.027		0.505	**	-0.675	**	0.168		-0.902	**
Opport. to use bicycles for various activities – very imp.			-0.181		-0.457		0.042		-0.121		-0.238	
Opportunit. to park a bike where you live – very imp.			0.246		-0.101		0.044		0.579	**	0.419	
Opportunit. to walk to different activities – very imp.			-0.938	***	-0.908	***	-0.980	***	-0.926	***	-0.845	**
N used =	2674		2087		1293		1147		1367		1124	
Nagelkerke R2	0.28		0.48		0.48		0.53		0.41		0.58	

Discussion and conclusion

Families who move from the inner city increase their housing consumption in square meters and frequently settle into detached, semi-detached, or terraced houses. Living space increases in relation to the distance from the city centre. Compared to stayers, a typical mover locates in a low-rise house and is of the opinion that one bedroom for each child, a safe residential environment for children and safe play areas close to the dwelling are important. Stayers differ from movers by putting emphasis on the social environment, living close to friends, and having the opportunity to walk to different activities.

Oslo is a divided city with an affluent western side. Also, the two municipalities in the western part of Akershus have higher income levels and house prices than the rest of Akershus (Barlindhaug, 2016). When splitting movers from the inner city in two moving directions, those who moved in westerly directions have higher incomes and higher housing consumption in square meters, and most of them belong to the majority population. In the moving direction from the inner city to the outer city east, the share of owner-occupation rose significantly when moving. Many of those movers had low incomes, a country background from Africa or Asia and bought a home in a location where they could afford to buy.

Income plays separate roles in easterly and westerly moving directions when comparing movers with stayers. High incomes increase the probability of moving in a westerly direction compared with staying. Households with high incomes are looking for locations in affluent areas (Galster & Magnusson Turner, 2017). Having low incomes means that the probability of moving in an easterly direction increases. For many, this means giving up their desire to continue living in the more expensive inner city housing market in a more spacious dwelling that is suitable for their needs. These families could be characterised as displaced urbanists (Mitchell, 2004). Single parents seem to belong to this group, but many of them have chosen not to move out of the inner city and have located in a residence they can afford.

The results from this study show that families with children in urban areas, belonging to the same life course, do not have homogenous housing and location preferences. For different reasons (shown above), some seem to prefer to live in the inner city and others in the suburbs or in the neighbouring county. Long distance movers prefer large living spaces in low-rise houses with private outdoor areas. Such housing conditions are most widespread outside the inner city and can be provided at much lower prices than similar houses that are more centrally located. They also report that these locations are most suitable for bringing up children and place the advantages of their location ahead of the disadvantages connected to the daily commute to and from work. This is in line with earlier research based on mapping families' motives for moving (Gkartzios & Scott, 2010).

Many wealthy families, with the opportunity of choosing location, prefer attributes connected to suburban living. Low-rise housing and private outdoor areas are especially hard to achieve in more central locations. Both stayers in the inner city and movers strongly care for their children's playing opportunities and their school environment and think that short distances to different activities both for children and adults, in addition to independence of daily car use, result in a meaningful life. Many families with children are leaving the inner city before school age, but some choose to stay. In line with Kartsten (2007) and Boterman and Bridge (2015), we find that having invested in a network of friends in the inner city strongly reduces the probability of leaving. The advantage of these networks of friends is strengthened by short distances to different activities, both for children and adults, and being independent of daily car use. But since so many families actually leave the inner

city, both children and adults who stay often lose their close friends (Karsten, 2007; Boterman, 2012).

For the local authority of Oslo there is a goal to reduce the out-mobility of families with children from the inner city. Expensive compact city developments, sometimes at the expense of private and public green spaces, with norms for dwelling sizes to secure a high share of large flats in new developments, do not keep many low-income families with urban preferences in the inner city. New housing projects in the inner city of Oslo are also criticised for being inflexible during varying childhood needs and for not having enough private outdoor areas reserved for the inhabitants. Some question the consequences of further densification on the growing-up environment and suggest that parks cannot compensate for missing local green spaces (Dale Nordbakke, 2018; Barlindhaug et al., 2018). Traffic in the inner city, noise, pollution, and a general lack of safety connected to crime and drugs will still be important push factors for moving, despite a possible improved housing policy for keeping more families with children in the inner city.

Owner-occupation is a politically stimulated and economically preferable tenure form in Norway. Regulating a part of this market to provide more affordable houses for low- and middle-income groups is on the political agenda and could be a possible instrument for keeping more families with children in the inner city. There is, though, limited space for new construction in the inner city, especially if developments are to be child friendly. A question for future research would be to illuminate the consequences of keeping more of the out-migrating families in the inner city. Should it be at the expense of young single people who strongly prefer a central location? If these really are conflicting interests, a greater acceptance of the high outmigration today is a pattern that could be seen as a part of families' housing careers, as it always has been. A focus on more effective transport solutions from satellite cities into central Oslo would be an alternative solution instead of regulating much of the housing supply in inner city, thus avoiding many problems connected to the access to a scarce asset. Another topic for future research could be to focus on possible differences in preferences for location among young children and adults in the same household.

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Appendix: Questions in the survey used in the logistic regression analyses

In construction of the following dummy variables in the logistic regression, questions 25, 26, 28 and 29 to the movers and questions 39, 40, 41 and 42 to the stayers without moving plans were combined. Also included is question 38, which defines stayers without moving plans.

Table A1 Combination of questions from the questionnaire for construction of dummy-variables in the regression

Dummy-variables	Movers	Stayers
One bedroom for each child – very important	29-8	42-8
A safe living environment for children – very important	26-1	40-1
Safe play areas adjacent to the dwelling – very important	29-15	42-15
Safe way to and from school – very important	26-2	40-2
Stable school class environment – very important	28-1	41-10
Proportion. of pupils in school who are native speakers of Norwegian – very imp.	28-2	41-11
Low noise – very important	26-4	40-5
Low pollution – very important	26-5	40-6
Closeness to the immediate family – very important	25-1	39-6
Closeness to friends – very important	25-2	39-7
Conditions of the social environment – very important	26-6	40-7
Who lives in the surrounding area/neighbours – very important	26-7	40-8
Opportunities to use a car for various activities – very important	26-10	40-11
Good parking facilities for cars – very important	26-8	39-8
Opportunities to use public transport for various activities – very important	26-11	40-12
Opportunities to use bicycles for various activities – very important	26-12	40-13
Opportunities to park a bike where you live – very important	26-9	39-9
Opportunities to walk to different activities – very important	26-13	40-14

The respondents were asked to give the following questions/lines one of the alternatives:

- Very important
- Quite important
- Rather important or unimportant
- Quite unimportant
- Very unimportant
- Do not know

In construction of dummy variables for the regression analyses, a division between “very important” and other categories was done.

Movers Q 25 What was important for your household when it came to the dwelling and residential area you moved to? Family

1	Closeness to the immediate family (children, siblings or parents you do not live with)
2	Closeness to friends

Movers Q 26 What was important for your household when it came to the dwelling and residential area you moved to? Living environment and leisure

1	A safe living environment for children
2	Safe way to and from school
3	Play possibilities for children
4	Low noise
5	Low pollution
6	Conditions of the social environment
7	Who lives in the surrounding area/neighbours
8	Opportunities to park a car where you live
9	Opportunities to park a bike where you live
10	Opportunities to use a car for various activities
11	Opportunities to use public transport for various activities
12	Opportunities to use bicycles for various activities
13	Opportunities to walk to different activities

Movers Q 28 What was important for your household when it came to the dwelling and residential area you moved to? School and kindergarten

1	Stable class environment
2	Proportion of pupils in school who are native speakers in Norwegian
3	Getting to the desired/desirable school district

Movers Q 29 What was important for your household when it came to the dwelling you moved to?

1	Price per square metre
2	The dwelling is not overlooked (no opposite neighbour)
3	The dwelling has a view
4	The dwelling has a private balcony/terrace
5	The dwelling has its own private outdoor area
6	The dwelling has a common outdoor area with neighbours
7	The dwelling has two bathrooms/WC
8	The dwelling has its own bedroom for each child
9	The dwelling has a large enough total area
10	The dwelling is located on the lowest floors
11	The dwelling is located on the upper floors
12	The dwelling has good physical standard
13	The dwelling has an elevator
14	The dwelling has an entrance on the ground floor
15	Safe play areas adjacent to the dwelling

Stayers: Those who have confirmed that they have lived in the inner city with children for at least four years

All stayers Q 38 Are you planning on moving out of the inner city?

1	Has clear relocation plans to move from inner city
2	Expect to move from inner city within 3 years
3	Expect to live in this dwelling or another dwelling in the inner city for at least 3 more years
4	Has no plans to move from inner city

Those who answered 3 or 4 are stayers without moving plans in the analysis

Stayers Q 39 How important or unimportant are the following for your household having no plans to move from the inner city in the next few years?

Conditions related to economy, travel to work and family

1	We do not have sufficient equity to move to another/desired dwelling
2	Short journey/time to current job
3	Opportunities to travel by public transport to work
4	Opportunities to cycle to work
5	Opportunities to walk to work
6	Closeness to the immediate family (children, siblings or parents you do not live with)
7	Closeness to friends
8	Good parking facilities for cars
9	Good parking facilities for bicycles

Stayers Q 40 How important or unimportant are the following for your household having no plans to move from the inner city in the next few years? Conditions related to living environment and leisure

1	A safe living environment for children
2	Safe way to and from school
3	Good school environment
4	Play possibilities for children
5	Low noise
6	Low pollution
7	Conditions of the social environment
8	Who lives in the surrounding area/neighbours
11	Opportunities to use a car for various activities
12	Opportunities to use public transport for various activities
13	Opportunities to use bicycles for various activities
14	Opportunities to walk to different activities

Stayers Q 41 How important or unimportant are the following for your household having no plans to move from the inner city in the next few years? Conditions related to walking distances to different chores and school/kindergarten

1	Walking distance to public transport
2	Walking distance to school
3	Walking distance to kindergarten
4	Walking distance to shops/shopping centres
5	Walking distance to cafes and restaurants
6	Walking distance to cultural life (museum, theatre, cinema etc.)
7	Walking distance to nature and the environment (field, sea, etc.)
8	Walking distance to park
9	Cycling distance to daily chores
10	Stable class environment
11	Proportion of pupils in school who are native speakers of Norwegian

Stayers Q 42 How important or unimportant are the following for your household having no plans to move from the inner city in the next few years? Conditions related to the dwelling.

1	The dwelling has a view
2	The dwelling has its own private outdoor area
3	The dwelling has a common outdoor area with neighbours
4	The dwelling has a balcony/terrace
5	The dwelling has a closed kitchen
6	The dwelling has two bathrooms/WC
8	The dwelling has its own bedroom for each child
10	The dwelling is located on the lowest floors
11	The dwelling is located on the upper floors
12	The dwelling has good physical standard
13	The dwelling has an elevator
14	The dwelling has an entrance on the ground floor
15	Safe play areas adjacent to the dwelling

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