

The impact of housing production on tax revenue in Helsinki

1.1. Introduction

In this paper, “taxable income cake” or just “taxable income”, refers to the lump of money consisting of wages, salaries, dividends, rents etc. that is subject to taxation.

Housing production can influence taxable income in a city in two ways. The primary impact comes from people moving from another municipality into new-built dwellings in the city. The secondary impact comes from people from other municipalities moving into those dwellings left vacant by city residents moving to new-built dwellings in the city. The data on this migration movement that I needed for my study were provided by Statistics Finland, covering first the years 1996-2000 and later the period 2001-2005. The material included data on the household structure of those who moved, on their marital status or phase of life, employment, education and other structure data, in other words factors that influence the population structure of the city to which people move. This presentation, however, will not cover all these factors, but focus on the economic effects of migration from the angle of taxable income.

1.2. Calculation method and findings from 1996-2000

In the following we analyse the relationship between the income of those moving into new-built dwellings and the average income in the whole city. I made the calculation of the overall effect by first calculating the annual average incomes of households of various housing ?? tenure status. I also picked the corresponding housing production data from the register. From the figures thus received I calculated the average income weighted with the numbers of dwellings. This method ensures that the composition of the sample does not influence the calculation of the averages. The idea can be expressed by the following formulae:

The assessment of the total impact I_t of housing production takes places by applying the average incomes a_{it} for various housing forms in the years t to the total housing production in 1996-2000 H_{it} , which has been grouped into various housing forms i . The primary removals were divided into those coming from the city and those coming from another municipality. This division was necessary because only those moving into the city influence the aggregate taxable income in a city. Since the proportion of in-movers from other municipalities is not the same for all housing forms produced, these differences were taken into account in terms of a distribution ratio J_{it}^a , where a refers to migrants from either the city or some other municipality. Thus the equation applied in my calculation goes as follows:

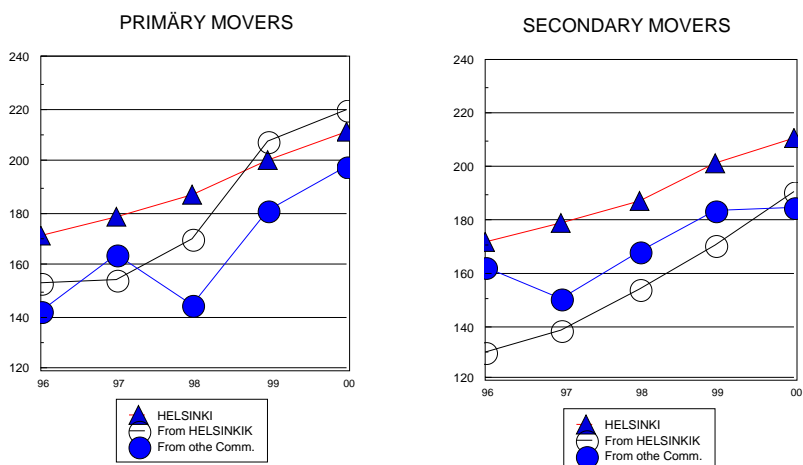
$$I_t^a = \left(\sum_{i=1}^n a_{it} H_{it} J_{it}^a \right) \div \sum_{i=1}^n H_{it} J_{it}^a$$

The calculation of the effect of primary removals uses the whole material, but the calculation of the effect of secondary removals only those people who moved to dwellings left vacant by the primary movers.

The calculation is made using three different income concepts, namely first the state taxable income, which describes the whole “taxable income cake”. This was compared with the average income of households in the whole city (data drawn from the Helsinki Area Database). In higher income brackets, the proportion of capital income may even be high. The second income concept is that of municipally taxable income, which is essential for the taxable income cake. For this concept, too, a comparison is made with the whole national population. The calculation still proceeds by households. Besides these two concepts, the concept of consumer unit was used because it allows us to equalise the effects of varying marital status in households.

First we look – from the angle of state taxable income – at how average incomes in households change over time compared with the average income in the whole city. The comparison is first made by housing form, then by overall impact of housing production, and finally by origin of the mover.

Figure 1: Average municipally taxable income among all Helsinki residents, those moving within Helsinki and those moving from another community. Primary vs. secondary movers in 1996-2000



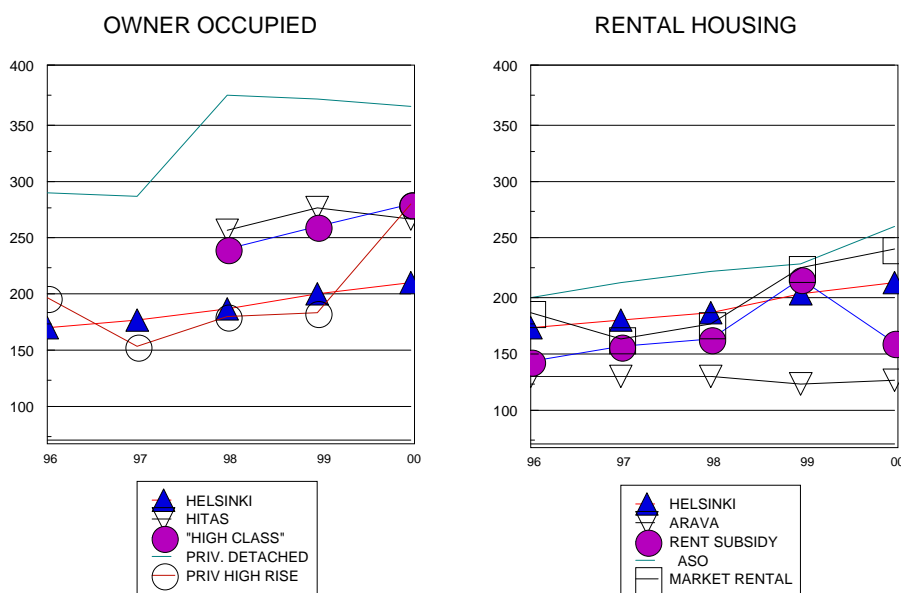
Towards the end of the period studied, the average income of primary movers as a whole rises above the average income of the whole city. Among primary movers, those moving into Helsinki from elsewhere are slightly below those moving within Helsinki. Secondary movers, on the other hand, are below the city average regardless of their origin, but here, those coming from outside Helsinki have a slight lead.

In housing built on private ground a distinction is made between a) detached + terraced (= row) houses and b) blocks of flats (= high rise). In all forms of owner-occupied housing, average incomes of households are above the average income of the population in Helsinki. Those living in detached or terraced houses are clearly above the other forms of housing. In blocks of flats (high rise), average incomes are about the same regardless of whether the house is built on private or council ground. Owner-occupied housing built on council ground are divided into two categories: a) hitas-dwellings where the price of which is regulated, and b) unregulated ‘high-class’ dwellings.

The rented housing sector consists of the traditional council (= municipal) housing, i.e. social housing and its modern variant rent subsidy housing. A third category also exists, namely those dwellings where the tenant pays a deposit of 15% of the value of the dwelling. This deposit is returned with interest when the tenant moves away. These three types are regulated with regard to the production price – unlike open-market rented dwellings.

The rhythm of changes varies over time. Household income has varied at a roughly equal pace in price-regulated owner-occupied dwellings and high-class rented dwellings. In 1996-97 only 4% of high-class rented dwellings were completed, for which reason their bulk is found in the last two years of the period studied. The same goes for the price-regulated owner-occupied dwellings, with a proportion of 5.5% in those same years. Right then the open-market production of owner-occupied housing was still in deep recession. In the rented housing sector, the income level of deposit tenants has stayed quite near the average income of all Helsinki residents. If we look at traditional council housing, there is a relatively big difference between those living in Arava dwelling vs. rent subsidy dwellings. And neither type shows the rise of income level with age that is typical of all other forms of housing.

Figure 2: Yearly income level in Owner occupied and rental housing in Helsinki, 1000 Fim



(1 € = 5,94571 Fim)

So far, we have been making calculations per household, i.e. we have used households as divisor in the calculations. However, we have seen earlier that the concept of households can be problematic because they can contain one or several income earners. And if we would use the population figure as divisor, the relationships between families with children and singles will turn the other way around. Therefore we use the concept of consumer unit, which will give a more balanced picture.

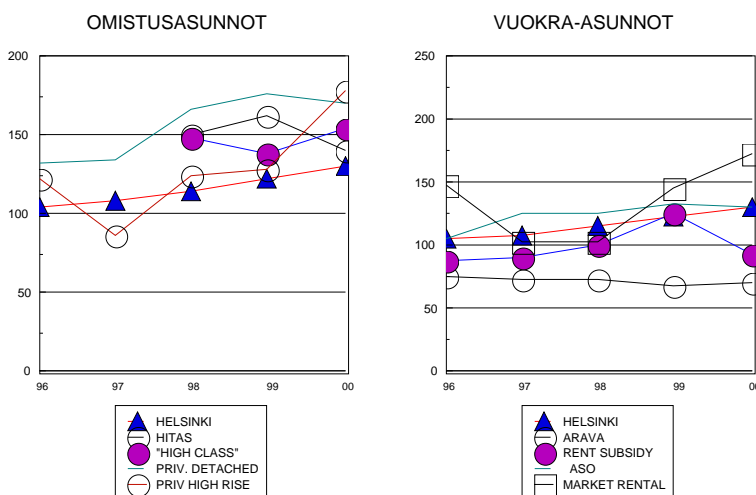
Table 1. Average income of Helsinki's population and the unweighted sample using various income concepts 1996 and 2000, (FIM1,000)

	Helsinki's population		Newbuildings in sample	
	1996	2000	1996	2000
State-taxable per household	182.1	251.8	164.1	222.1
Municipal-taxable per household	171.8	211.3	141.9	188.5
Municipal-taxable per person	85.6	105.9	62.7	92.8
Municipal-taxable per consumer unit	105.8	130.2	85.4	117.9

A similar chronological analysis was made by comparing the incomes of Helsinki's entire population vs. primary and secondary mover also in terms of consumer units. Unlike our earlier comparison, the relative position of owner-occupied housing on private ground falls, particularly in detached and row houses. In this form of housing, the high proportion of families with children implies a rising number of consumer units. Here, even open-market rented dwellings rise above the average of the city.

As a consequence of these changes the overall average, which first seemed to give "deficit", rises above the population average in 1996 and 2000 both among primary and secondary movers. In this movement, especially those moving within Helsinki quickly raise their position. It should be noted, however, that in secondary removals, those who have moved into Helsinki have always stayed above the average of Helsinki's entire population, and gradually increased their lead. This factor has the biggest significance in the equation that converts the population increase in dwellings in Helsinki into its impacts on the taxable income cake.

Figure 3: Municipal-taxable income per consumer unit in dwellings of various tenure status



The variations seen in the average income are naturally also influenced by those factors that influence the housing production any given year. In the year 1998, for example, such a factor was the stronger-than-usual emphasis on Arava dwellings. The Hitas and High

Class categories are new categories that have been around only for the last three years of the study, for which reason the perspective is short in their case.

On these grounds we can note that the primary moving has to a certain extent strengthened taxable income in Helsinki, because those moving into Helsinki have a 7% per capita higher income level than those leaving Helsinki. In the annual analysis that uses consumer units these changes are seen in the last two years of the period studied. In the secondary removals, the income level of those moving into Helsinki is 14% higher per household and 17% higher per capita than those moving away from Helsinki. These ratios have varied over the years. The comparison using consumer units has annually shown that in-movers to Helsinki have earned more than the population average. Especially those moving into homes left vacant by people moving into new-built homes have had clearly higher incomes than their predecessors. When we take into account that secondary removals have a much stronger impact quantitatively than the primary ones, we can say that the housing production pursued has indirectly consolidated Helsinki's taxable income cake. Moreover, this impact increase has taken place during the last few years of the period studied.

When we assess the total impact on taxable income we have to account for the total numbers of movers. In the period 1996-2000 a total of 153,500 people moved to Helsinki from elsewhere. 3,000 of them moved into new-built dwellings and 7,300 to dwellings left vacant by Helsinki residents moving to new-built dwellings.

Thus just under 7% of those moving into Helsinki from elsewhere found a home in either a new-built dwelling or in the first link of the removal chain caused by these new dwellings. The remaining over 90% of those moving to Helsinki have found homes in those dwellings left vacant by people moving from Helsinki or due to deaths. Over 1996-2000, a considerable number of dwellings became vacant, since around 130,000 people moved away from Helsinki. So, essentially more moving chains are caused by migration than by the production of new housing.

1.3 The significance of the housing form for the generation of taxable income

About the calculation method

When measuring the income level, we need to consider which concept to use to compare the incomes of households. Because we know that income per household and income per capita produce very different findings depending on the proportion of lone income earners vs. two-earner households. The number on non-earning children will have an opposite effect in the comparison. In this context, the use of consumer unit will be the most appropriate concept. Its equalising effect on differences in family structure gives a better opportunity to compare housing forms than, for example, the household concept would. And quantitatively as well, the number of consumer units is close to the number of income earners, which normally is the best concept in comparisons of taxable income.

But there are other possible ways of comparing the income levels of people moving into new-built housing. These focus on aspects of effectiveness. An acknowledged problem in the planning of land use in Helsinki is the limited amount of land available for housing construction and the often high costs for ground technology. Thus we also have reason to look at how taxable income turns out per floor area in the new housing production. This

finding is influenced by differences in housing density between various housing forms. And the shortage of ground available is a good reason for calculating also how the taxable income turns out per unit of planned land. Here, the exploitation ratio of the land (floor area by ground area) is a crucial factor for our calculation.

Table 2. Land exploitation ratio in various municipalities of the Helsinki Metropolitan Area by municipality and type of house

	Helsinki	Espoo	Vantaa	Yht.
High rise	1.198	0.854	0.803	0.108
Dtached	0.232	0.094	0.096	0.310
Row House	0.393	0.271	0.293	1.032

The calculation goes from households via consumer units to inhabitants, from there to housing floor area and finally to ground used. Formally we are talking about the equation

$$P_{it}^n = 100 \times A_{it}^n \div \sum_{i=1}^7 \sum_{t=1}^3 A_{it}^n, \text{ where}$$

P_{it}^n = relative average income

A_{it}^n = average income n in the housing form i and building type t

$n1$ = households

$n2$ = consumer units

$n3$ = inhabitants

$n4$ = housing floor area

$n5$ = ground

Land exploitation ratio in various types of buildings in the Helsinki Metropolitan Area in 1996-2000

	Helsinki	Espoo	Vantaa	Yht.
KT	1.198	0.854	0.803	0.108
PT	0.232	0.094	0.096	0.310
RT	0.393	0.271	0.293	1.032

We see that land exploitation has been higher in Helsinki than the other two cities in all building types. The difference is particularly great in ?? detached houses: 2.5-fold. Below, we see the findings also in a figure on municipal-taxable income.

Figure 4: Comparison of average income (municipal-taxable) in various forms of housing

So, we have seen five different approaches to calculating the impacts of housing production on a municipality's taxable income. We saw that the findings depended strongly on what angle we wanted to emphasise. None of the approaches is right or wrong *per se*. For example, income per household reflects the purchase power of households particularly when the analysis includes tax on capital, which is relatively light. From this angle, a

housing production focussing on detached and terraced houses would seem good for the taxable income. Then, if we look at income per capita and account for differences of household structure due to lone or double income earners and number of children, this equalises the difference between housing forms and, especially, types of building. And if we use income per consumer unit, it equalises these approaches in a reasonable way. Moreover, if we shift our angle towards land exploitation, findings change again. The shortage of construction land urges a focus on the concepts of land exploitation and housing floor area. This leads to an analysis of taxable income per floor area unit. Here, the exploitation ratio is crucial. If we apply these “extra” angles, findings become quite different.

17.3 Impact of new-built housing on the taxable income cake in the city in 2001-2005

We continued our study by ordering materials covering the years 2001-2005 from Statistics Finland. During that period, housing production fell and became more oriented towards owner-occupied dwellings. Now, data on people moving in to second-hand dwellings were provided as well.

Table 3: Number of households in various types of removals in 2001-2005

Numbers

year	new-built			second hand			moving chain
	HEL/HEL	HEL/OTH	OTH/HEL	HEL/HEL	HEL/OTH	OTH/HEL	
2001	2369	771	1301	18663	6093	21741	1904
2002	1755	869	839	19750	6824	21241	1162
2003	2273	1057	909	22011	6945	21608	1570
2004	1665	1068	855	22808	6850	22133	1108
2005	1330	955	723	30210	7121	28617	831

New-built housing naturally attracts Helsinki residents, but people from other municipalities, too, have moved into these new dwellings. This current has weakened with falling housing production. But the current of Helsinki residents moving to new-built dwellings in other municipalities grew up until 2004 and exceeded the number of people moving from other places to Helsinki. In the current to second-hand vacancies, the *proportion* of Helsinki residents has grown whilst the *number* of movers from other municipalities has grown, too, especially in 2005. The total incomes brought by these removal currents are shown in the following.

If we look at removals to all new-built dwellings in the Helsinki Metropolitan Area, Helsinki loses more residents than it gets. But the moving chain provides another element that turns the balance positive again: the number of people moving into second-hand vacancies is so large that the total income becomes positive by €250-500 million. The exactness of these figures is hampered by the fact that the crowd of migrants to Helsinki includes people whose income is known but their origin is unknown. Part of them may be from Helsinki.

An analysis by average income shows that those people moving into new-built housing in Helsinki or the other municipalities have clearly better incomes than others.

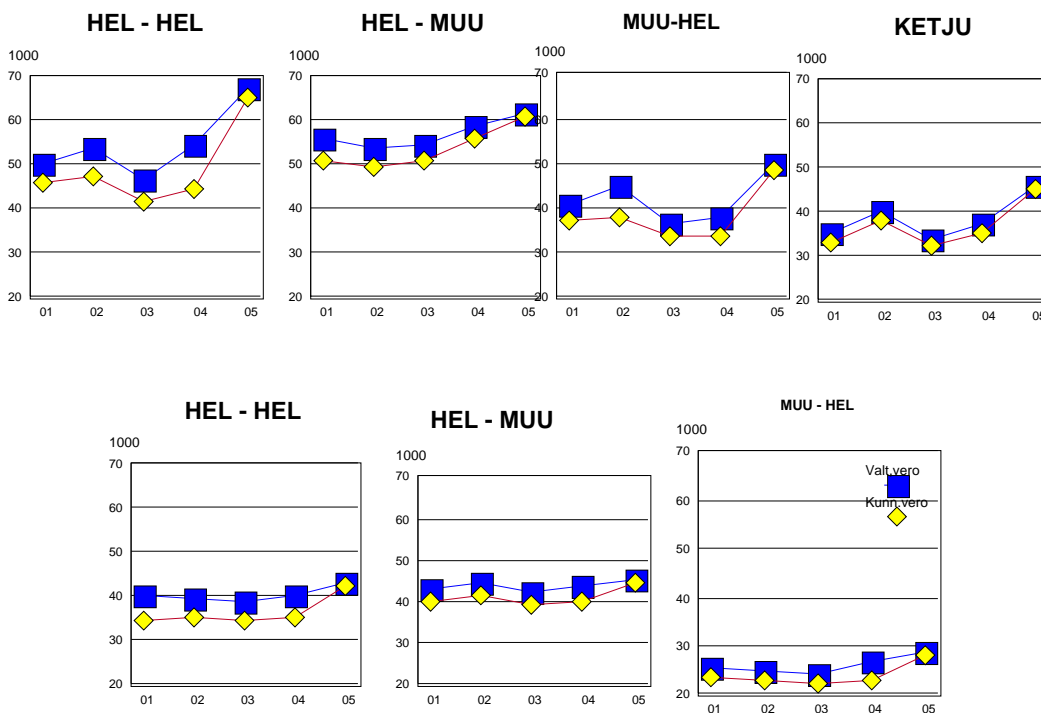
Table 4. Taxable income cake (€million) and average income per household in moving currents in 2001-2005

Total income, €million							
year	new-built		second hand			moving chain	
	HEL/HEL	HEL/OTH	OTH/HEL	HEL/HEL	HEL/OTH		OTH/HEL
2001	108.31	39.24	48.45	648.08	242.20	518.14	63.15
2002	83.28	42.85	31.87	695.23	281.31	484.36	44.12
2003	95.39	54.29	30.98	760.96	273.86	479.98	50.94
2004	74.42	59.80	29.11	805.87	275.74	504.86	39.38
2005	87.13	58.44	35.28	1283.01	319.69	812.82	37.46

Average income/household							
2001	45721	50889	37238	34725	39750	23832	33166
2002	47451	49314	37989	35202	41223	22803	37973
2003	41967	51367	34081	34572	39433	22213	32446
2004	44696	55990	34048	35333	40254	22810	35542
2005	65511	61190	48793	42470	44894	28403	45080

The following diagrams also compare the differences of state- and municipal-taxable income in removals. The upper row presents the effects of the new housing production, the lower row those of removals to second-hand dwellings.

Figure 4: Average state- and municipal-taxable income of people moving within, to and from Helsinki in 2001-2005.



Regardless of direction, removals show a fall in income level between 2001 and 2003, and a clear rise between 2004 and 2005. The most outstanding category are those moving from other municipalities to second-hand dwellings in Helsinki: their income level is

relatively low. The life-phase bit of the analysis showed that in this particular group, the proportion of students is considerable.

Our calculations gave the following results: municipal-taxable income in Helsinki rose as a consequence of housing production, if we accounted for only those moving in from other municipalities and for their income during the year before the removal. The balance is positive each year, although it is rather small in 2003 and 2004.

	€ million
2001	3.3
2002	4.5
2003	0.7
2004	0.5
2005	6.2

In the following, we take a look at the economic effects of various forms of housing production. In the part of the study covering the years 2001-2005, we can make the analysis of the role of various tenure statuses from just two angles, namely calculated per household or per housing floor space. The analysis for 1996-2000 covered five different aspects.

Table 5: Relative income level per household, when the entire housing production = 100

	origin			
	Helsinki		Other municipality	
	ST	MT	ST	MT
Detached house	189.3	181.5	134.1	125.9
Owner det/row	162.0	165.3	183.5	184.9
Owner high-rise	114.9	115.5	113.3	112.6
Arava rented	82.1	81.4	89.6	88.1
Subsidised rented	54.5	58.7	42.5	48.1
Other rented	93.2	94.7	99.5	102.1
Deposit	77.9	83.2	73.0	81.6
All together	100.0	100.0	100.0	100.0

(VV= valtionveron alainen tulo, KV= kunnallisveron alainen tulo)

Table 6: Relative income level by floor area, when the entire housing production = 100

	origin			
	Helsinki		Other municipality	
	ST	MT	ST	MT
Detached house	101.7	97.5	76.1	71.5
Owner det/row	117.8	120.2	131.5	132.4
Owner high-rise	119.3	120.0	111.7	110.9
Arava rented	91.9	91.1	96.7	95.1
Subsidised rented	69.9	75.2	53.9	61.1
Other rented	110.5	112.3	114.7	117.7
Deposit	78.3	83.6	71.6	80.0
All together	100.0	100.0	100.0	100.0

The calculation by dwelling floor area pretty much levels out the differences between tenure statuses, but it changes their internal order only in places. Above all, detached housing loses importance due to its high housing space.

This research has been made to provide a factual background to those deciding on housing production. The analysis is strictly empirical, and there is no space for speculative interpretations.